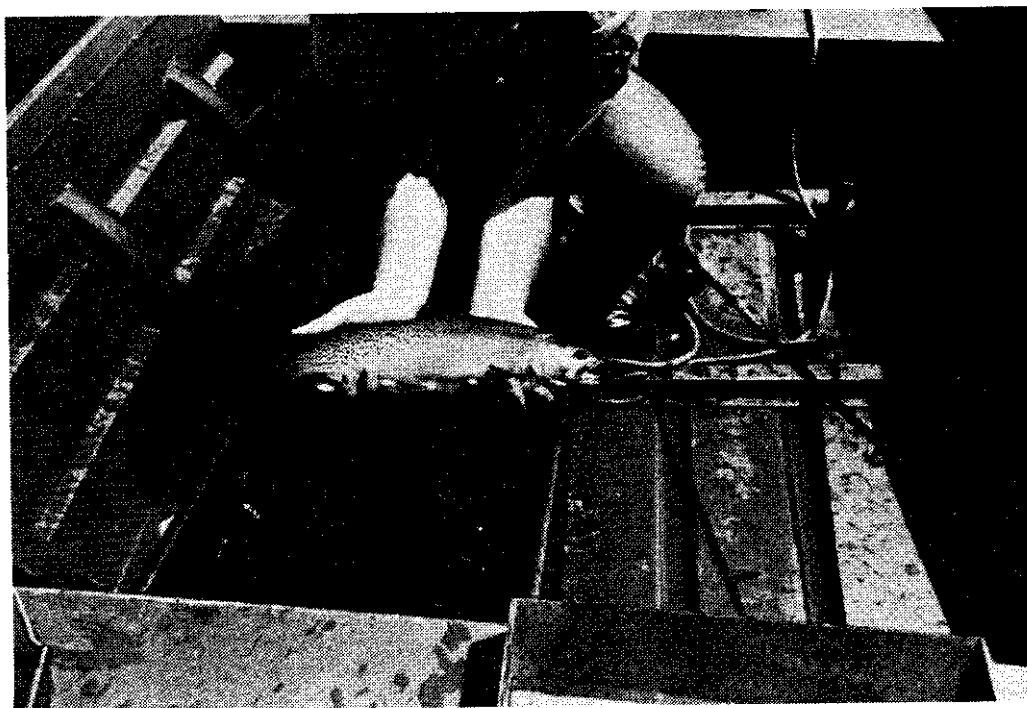


# FISHERY RESEARCH



## FEDERAL AID IN FISH RESTORATION

Job Performance Report, Project F-73-R-9  
Subproject IV: RIVER AND STREAM INVESTIGATIONS  
Study IV: North Idaho Stream Fishery Research  
Job 1: Fish Population Inventory  
Job 2: Fish Habitat Description  
Job 3: Fish Species and Stock Evaluation



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March 1988

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## JOB PERFORMANCE REPORT

State of: Idaho

Name: RIVER AND STREAM  
INVESTIGATIONS

Project No.: F-73-R-9

Title: North Idaho Stream  
Fishery Research

Subproject No.: IV

Study No.: IV

Job No.: 1. Fish Population Inventory

Period Covered: March 1, 1986 to February 28, 1987

### ABSTRACT

A structured creel survey was conducted on the Coeur d'Alene River from the North Fork downstream to Dudley to provide harvest and catch information for a previously uncensused portion of the river. Anglers expended an estimated 10,661 hours to harvest 2,467 trout and char between opening weekend and June 28, 1986. Westslope cutthroat trout Salmo clarki lewisi was the dominant species in the catch and averaged 317 mm long.

A fish population inventory was initiated on the St. Joe and St. Maries rivers in 1986. These rivers support viable populations of westslope cutthroat trout, rainbow trout Salmo gairdneri and brook trout Salvelinus fontinalis in the lower reaches. Twenty of 21 tributaries surveyed had populations of cutthroat trout. Bull trout Salvelinus confluentus numbers were depressed, with only 7 individuals captured or observed from April through October. The trout fishing was limited to the free-flowing area upstream from Bond Creek.

Relative trout abundance was estimated by snorkeling 13 transects in 7 tributaries in the St. Joe and St. Maries rivers. Trout densities ranged from 0.7 to 15.7 per 100 m<sup>2</sup>. Most tributaries were too small to snorkel effectively.

Using electrofishing techniques, we tagged 146 trout in the Coeur d'Alene River, 740 in the St. Joe River drainage, and 303 in the St. Maries River drainage to provide information on fish movement and angling mortality. Fish movement from tributaries to the Coeur d'Alene River is well documented, but no tags have been recovered from Lake Coeur d'Alene. Cutthroat trout tagged in the St. Joe River drainage have been recovered in the lake after spawning and have also traveled upstream from tagging sites as far as 65 km. Angling mortality varied from a minimum estimate of 32% in the Coeur d'Alene River to 13% in the St. Joe River based on tag returns.

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Fisheries data gathered on Lake Coeur d'Alene and its major tributaries have shown a general decline in trout populations and angler harvest over the last 30 to 40 years. Three major causes for these reductions are habitat loss or degradation, overexploitation, and competition from introduced species. In 1984, the Idaho Department of Fish and Game (Department) initiated studies of fish populations and habitat in the lower Coeur d'Alene, St. Joe, and St. Maries rivers to develop proposals for future management (Figure 1).

Ellis (1932) reported the South Fork Coeur d'Alene River and the main stem Coeur d'Alene River below the confluence with the South Fork were so polluted from mining waste that the river was devoid of fish life. This condition existed since before the turn of the century and remained toxic to some species as late as 1974. The Environmental Protection Agency did bioassay work on the South Fork and main stem in June 1973 and found that all rainbow trout held in live boxes at seven locations died within 48 hours (Kreizenbeck 1973). Live box analysis conducted in the Coeur d'Alene River in July 1974 showed toxicity had decreased to a level such that rainbow trout survived a 72-hour exposure. However, fish in the South Fork perished within 20 hours (Bauer 1975). Now, trout and other fish species are caught throughout the season within the same stream reaches (Horton 1985, 1986).

Upstream from the confluence of the South Fork, the Department conducted studies in 1973 to evaluate abundance, population structure, and harvest of game fish (Bowler 1974). Bowler compared cutthroat trout populations of the Coeur d'Alene and St. Joe rivers, documenting the poor condition of the Coeur d'Alene River fishery and suggested management changes for improving it. Lewynsky and Bjornn (1983) evaluated the affects of the special regulations established in 1975 after Bowler's work. They also assessed seasonal distribution and movement of trout, angler compliance to the regulations, and computed mortality rates for comparison to Bowler's results.

In a survey of the lower St. Joe and St. Maries rivers in 1959, Jeppson (1960) described fish populations similar to today's populations. Since then, extensive work has been conducted by University of Idaho and Department personnel. Davis (1961) did a limnological survey of the slackwater areas of both rivers. Life history information has been gathered on three races of cutthroat trout inhabiting the St. Joe River from slackwater tributaries upstream to the headwaters (Averett 1962; Rankel 1971; Mauser 1972; Athearn 1973; Bjornn and Athearn 1974; Bjornn and Thurow 1974; Thurow and Bjornn 1975). Several investigators studied or monitored the affects of special regulations established in 1971 and stream closures in 1973 on the cutthroat trout populations (Ortmann 1972, 1973; Goodnight and Mauser 1974; Bjornn and Thurow 1974; Thurow and Bjornn 1975; Walch and Mauser 1976; Thurow 1976; Johnson 1977; Thurow and Bjornn 1978; Johnson and Bjornn 1978). Angler preference played a major role in establishing the special regulations (Rankel 1971; Bjornn 1975; Johnson and Bjornn 1978).



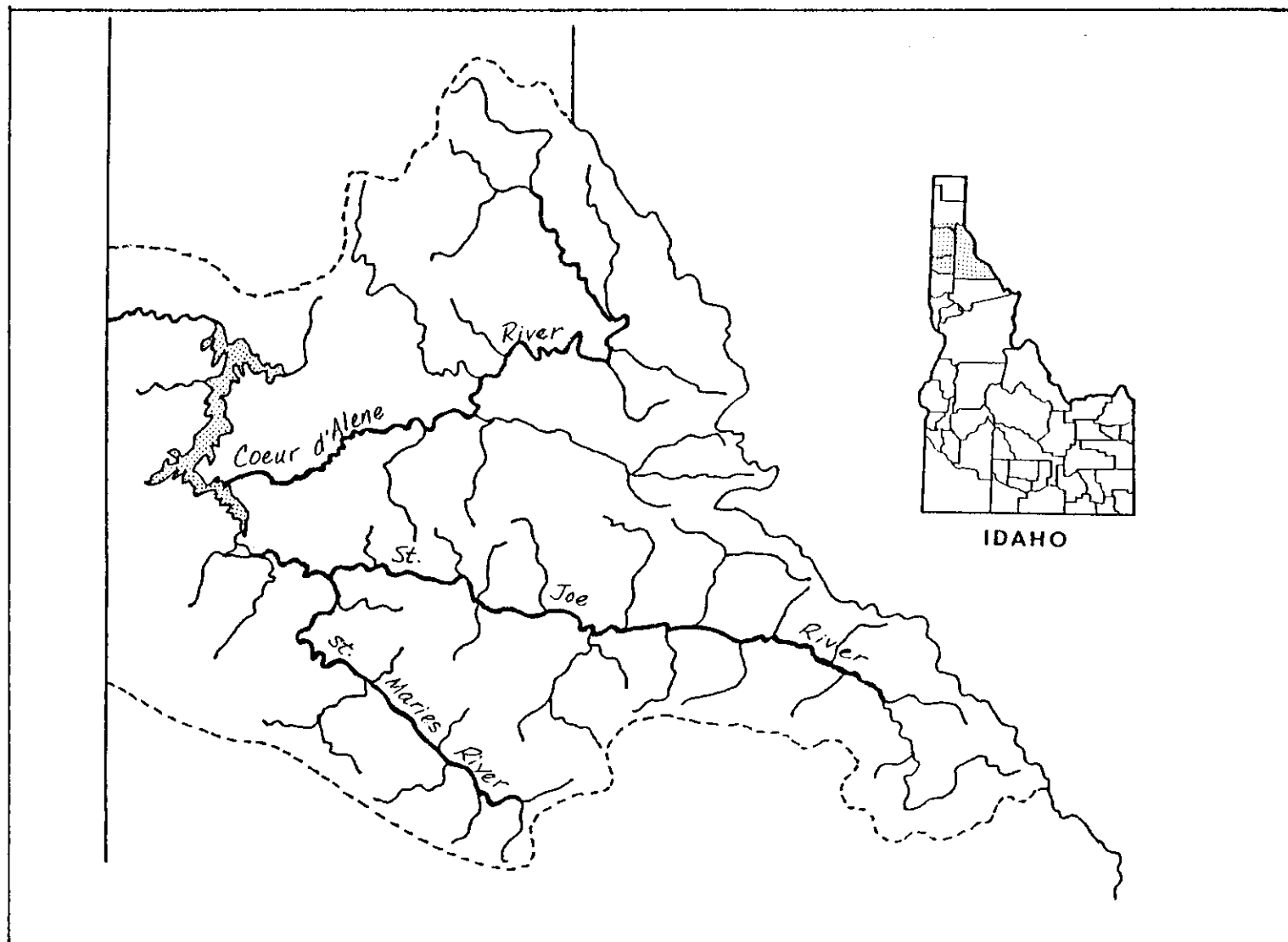


Figure 1. Spokane River drainage.

Investigations also centered on the biology and control of northern squawfish populations (Jeppson 1957, 1960; Jeppson and Plaits 1959; Falter 1969; Reid 1971) and the development and use of a chemical (SQUOXIN) selectively lethal to squawfish and closely related cyprinids (MacPhee and Ruelle 1969; MacPhee and Reid 1971; Ortmann 1972, 1973; Goodnight and Mauser 1974; Goodnight 1975).

Initial studies concluded that populations of cutthroat trout in the St. Joe River were relatively small, that soon after fish entered the river from tributaries they were harvested, and that angling caused a significant portion of the annual mortality (Rankel 1971). Rankel also concluded that the drainage was inadequately seeded with cutthroat trout fry and that few fish survived angling to mature and spawn. After several years of special regulations, Johnson and Bjornn (1978) concluded that special regulations had reversed the decline of cutthroat trout populations in the upper watershed, increasing abundance fourfold by 1975.

Most previous investigations were concentrated in upstream areas. We concentrated our efforts downstream from Marble Creek, including the slackwater portion of the St. Joe River. The St. Maries River has received only cursory study, so our inventory includes not only the slackwater portion, but the free-flowing reach upstream to the confluence of the Middle Fork St. Maries River and Merry Creek.

## **OBJECTIVE**

To assess the status of the game fish populations in the lower St. Joe River system.

## **RECOMMENDATIONS**

Close the St. Joe River to the harvest of bull trout.

Pursue supplemental stocking of westslope cutthroat trout in underseeded drainages in lower river tributaries to reestablish natural populations.

Perform creel surveys on the St. Joe and St. Maries rivers to compare harvest, catch rates, species composition, and angler attitudes with previous surveys.

## METHODS

### Creel Survey

We conducted a stratified random creel survey on the Coeur d'Alene River from the North Fork Coeur d'Alene River confluence downstream to Dudley between May 24 and June 30, 1986. The survey area was divided into three sections (Figure 2). Section 1 was between the North Fork Coeur d'Alene River and the South Fork Coeur d'Alene River, Section 2 was from the South Fork downstream to the Interstate 90 bridge, and Section 3 was from the bridge downstream to Dudley.

The survey included two 14-day intervals and one 10-day interval. We randomly selected six weekend days and six weekdays, and selected Memorial Day as count days. Three counts were made on each survey day. A count consisted of counting anglers throughout all three sections followed by angler interviews until a four-hour time period ended.

Anglers were interviewed for residency, hours fished, species caught, and angling method (boat or shore). We used the methodology outlined by Thurow (1981) for estimating angler effort and harvest by river section and angler method (shore or boat) as follows:

$$X \text{ WD (H)} + X_i \text{ WE (H)} - \text{angler effort (hours)}$$

Where: X - mean number of anglers counted for  
all weekdays during an interval

$X_i$  - mean number of anglers counted for all  
weekend days during an interval

WD - total weekdays per interval

WE - total weekend days per interval (

H) - mean daylight hours per interval

### Electrofishing

Electrofishing was used in tributaries and the main stems of the Coeur d'Alene and St. Joe rivers for determination of species composition and distribution, and to collect life history information. All game fish captured were anesthetized and total lengths were measured to the nearest millimeter. Most trout and some char between 100 mm and 250 mm were tagged with Floy FTF-69 fingerling tags sewn through the back near the posterior edge of the dorsal fin. Trout and char longer than 250 mm were tagged with monel metal or aluminum mandible tags. Presence of all species captured was recorded.

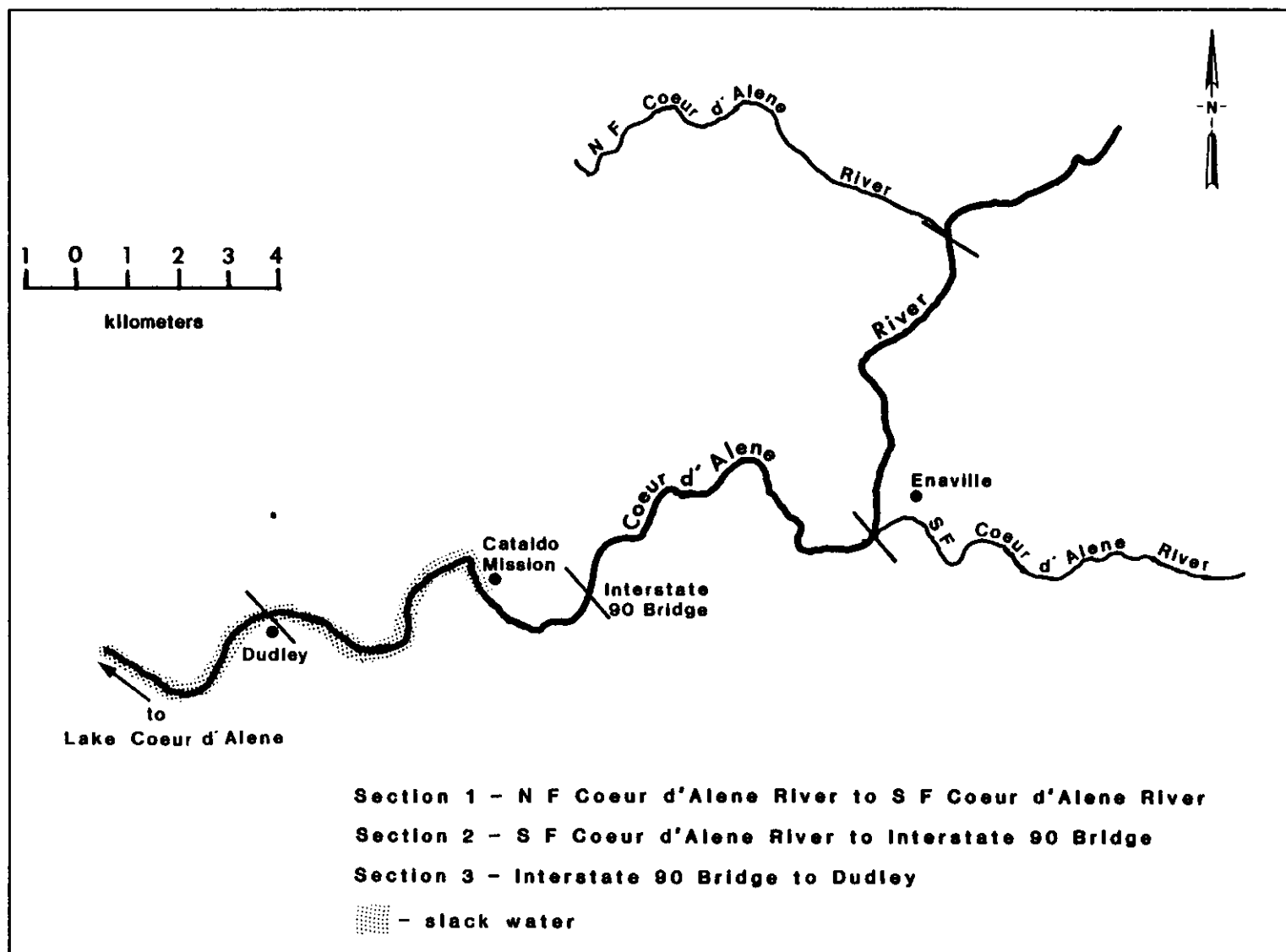


Figure 2. Location of creel survey sections on the Coeur d'Alene River, 1986.

A Smith-Root Model 11A, battery-powered backpack unit was used for sampling fish in tributaries. The Coeur d'Alene and St. Joe rivers were electrofished from a 5.0 m Alumaweld drift boat, modified with booms to hold the anodes, and spotlights for night sampling. It was equipped with a Coffelt Model VVP-2C (2000 watt) variable voltage pulsator, a Kawasaki Model 2900 generator, and live wells. A drift boat was needed because the river was too deep or too swift to wade, but too shallow in many areas to use a motorized boat.

### Snorkeling

Information on relative abundance of fish species was collected using underwater observation techniques similar to those described in other northwest studies (Johnson 1977; Sheppard et al. 1984; Pratt 1984). Pool-riffle-run complexes were snorkeled where available, but at least one pool and a riffle or run were counted per transect. Transects were at least 30 m long. Stream widths were measured in several locations, averaged, and then multiplied by the length to calculate total surface area. All fish densities were converted to number per 100 m<sup>2</sup> for comparison with other streams within the drainages and with other drainages. Snorkeling was conducted in late summer and early fall at low stream discharge, when little cutthroat trout movement occurs (Rankel 1971). Transects were chosen to represent average habitat.

### Tributary Trapping

In April 1986, we fished fyke nets in St. Joe and St. Maries river tributaries to sample migratory trout. Sampling was conducted weekly from April 2 to June 3 in 10 streams that were trapped 1 to 8 times (Table 1). Fyke nets were used so we could sample many streams with less effort and greater mobility than with weirs and traps.

Fyke net frames were 64 cm by 126 cm rectangles made of 2.5 cm square metal tubing. Nets were 4.0 m long with a 25 cm diameter cod end. Nets were attached to 21.5 cm diameter, 2.3 m long ABS sewer pipe. The pipe was connected to a trap box constructed of exterior plywood (65 cm x 76 cm x 61 cm). Velocity reduction baffles and exit holes were cut into the structure. Exit holes were covered with 6.4 mm square mesh hardware cloth.

In most cases, the nets fished the entire stream channel when 1.3 cm square mesh hardware cloth panels (3.0 x 0.9 m) were used in conjunction with the net frames to force passage through the net openings. Nets were fished from late afternoon to early morning and checked at approximately midnight to release fish, and clean panels and nets.

Table 1. Streams in the St. Joe River drainage trapped for outmigration with fyke nets during spring, 1986.

Stream	# nights	Dates trapped
Benewah Creek	8	April 15, 24 & 30; May 7, 13, 20 & 28; June 3
Cherry Creek	2	April 16 & 24
Hugus Creek	2	April 9 & 17
Mica Creek	2	April 17 & 29
Reeds Gulch	3	April 2, 8 & 15
Street Creek	2	April 2, 9
Thomas Creek	2	April 23; May 6
Thorn Creek	8	April 8, 16 & 30; May 7, 13, 20 & 28; June 3
Trout Creek	1	April 29
Whittenburg Draw	2	April 23; May 6

### Purse Seining

In November 1986, Lake Coeur d'Alene was sampled with purse seine gear to recapture cutthroat trout tagged in major tributaries from 1984 to 1986, and to capture, tag, and release trout for information on movement and angling mortality. The purse seine was fished for four days between Browns Bay, at the southern end of the lake, north to Tubbs Hill. Methods used were described by Mauser (1985).

### Cutthroat Trout Movements

In three years, 2,306 fingerling tags, 324 metal mandible tags and 39 Floy (spaghetti type) anchor tags were attached to trout and char. Tag recapture data was used to assess cutthroat trout movements and to determine which tributaries contributed fish to the river and lake fisheries. Total length, tag color and number, date, and location of capture were recorded for each fish tagged. Fish recovered within 2 km of the release sites were considered as not having moved. Bjornn and Mallet (1964) used similar criteria for cutthroat recaptures from the Middle Fork Salmon River.

To facilitate angler tag recoveries, project personnel posted signs at fishing access areas and at local sporting goods retailers, mailed news releases to local newspapers, and gave presentations to sportsmen's groups and public meetings. Local conservation officers also assisted by informing anglers and collecting tag return information. Anglers were asked to provide date and place of capture, length and condition of fish, and tag numbers. All anglers returning tags received a letter which explained the history of the fish and project activities. From 1985 to 1987, 56 tags with usable information were returned by anglers.

## **RESULTS**

### Creel Survey

Residents comprised 87% of the total anglers checked. Estimated minimum angler effort for the duration of the survey was 10,661 hours. Section 3 received the highest angling effort followed by sections 1 and 2 (Table 2). Section 3 accounted for 77% of total boat effort and 35% shore effort. Shore effort was the highest in Section 1 at 37%. Most of the angling effort occurred during Interval 1 and decreased in all sections during intervals 2 and 3. The most dramatic change occurred in Section 3 where 68% of total boat effort occurred during Interval 1 and decreased twofold each remaining interval. Additional information on angler effort by interval, section, and day-type for boat and shore anglers is detailed in Appendix A.

Table 2. Angler effort, by Section and interval, for boat and shore anglers during the Coeur d'Alene River creel survey, 1986.

Interval	Dates	Section 1			Section 2			Section 3			Total
		Boat	Shore	Combined	Boat	Shore	Combined	Boat	Shore	Combined	
1	May 24-June 6	241	1,390	1,631	98	969	1,067	1,782	1,510	3,292	5,990
2	June 7-June 20	111	1,060	1,171	142	648	790	771	678	1,450	3,410
3	June 21-June 30	<u>149</u>	<u>310</u>	<u>460</u>	<u>43</u>	<u>331</u>	<u>374</u>	<u>54</u>	<u>374</u>	<u>428</u>	<u>1,261</u>
Total		501	2,760	3,262	283	1,948	2,231	2,607	2,562	5,170	10,661



Estimated minimum total harvest for cutthroat trout was 1,767, of which 1,131 (64%) were harvested in Section 3 (Table 3). Most of the cutthroat harvested in Section 3 (81%) were caught by boat anglers, and mainly during Interval 1. Hatchery and natural rainbow trout were the most prevalent species caught in Section 1 and comprised 83% of the total harvest of rainbow trout for all sections. Rainbow-cutthroat hybrids were caught in all sections and the total estimated harvest was 131 fish. Brook trout and kokanee salmon Oncorhynchus nerka were only harvested in sections 2 and 3. A few brown bullhead Ictalurus nebulosus and yellow perch Perca flavescens were caught within the slackwater portion of Section 3.

Harvested cutthroat trout ranged from 160 mm to 400 mm with a mean length of 317 mm, and 21.6% were >350 mm (Figure 3). The two largest trout measured during the survey were a 465 mm brook trout and a 446 mm rainbow-cutthroat hybrid.

Catch rates (including fish released) for cutthroat trout were highest in Section 3, but decreased dramatically throughout the survey (Table 4). Section 1 had the highest trout catch rate, which decreased through the survey.

### Electrofishing

Backpack electrofishing was effective throughout the St. Joe River drainage, even in tributaries with low conductivity. Cutthroat trout were found in all tributaries surveyed in 1986. Other salmonids were found in most drainages, but the species composition was variable (Table 5). Cutthroat trout sampled in tributaries ranged from 30 mm to 380 mm and averaged 117 mm (Figure 4).

We used a drift boat to electrofish the St. Joe River from Huckleberry Campground downstream to Falls Creek (approximately 20 km) during the summer and fall. In two nights during August, we captured only three rainbow trout and no cutthroat trout. Suckers Catostomus sp., northern squawfish Ptychocheilus oregonensis, and mountain whitefish Prosopium williamsoni dominated the catch. By October, trout and char had migrated back to this reach in large numbers and occupied deep pools. Electrofishing was ineffective in capturing fish from these pools; however, we did capture more than 10 times the trout caught during the summer.

The drift boat was also used several nights to electrofish on the Coeur d'Alene River between the North Fork confluence and the Cataldo Mission. We sampled trout from May through October in this reach. During 1986, 1,043 trout were tagged in the St. Joe River system and 146 trout were tagged in the Coeur d'Alene River.

Table 3. Total estimated harvest, by species and section, during the Coeur d'Alene River creel survey, May 24 to June 30, 1986.

Section	Angling method	Harvest						Total
		Cutthroat trout	RBT-CTT hybrid trout	Natural rainbow trout	Hatchery rainbow trout	Brook trout	Kokanee salmon	
1	boat	53	5	10	51	0	0	119
	shore	283	28	48	306	0	0	665
2	boat	18	10	0	0	9	78	115
	shore	282	55	0	0	26	202	565
3	boat	924	18	11	11	18	214	1,196
	shore	207	15	32	32	15	251	552
Total	boat	995	33	21	62	27	292	1,430
	shore	772	98	80	338	41	453	1,782

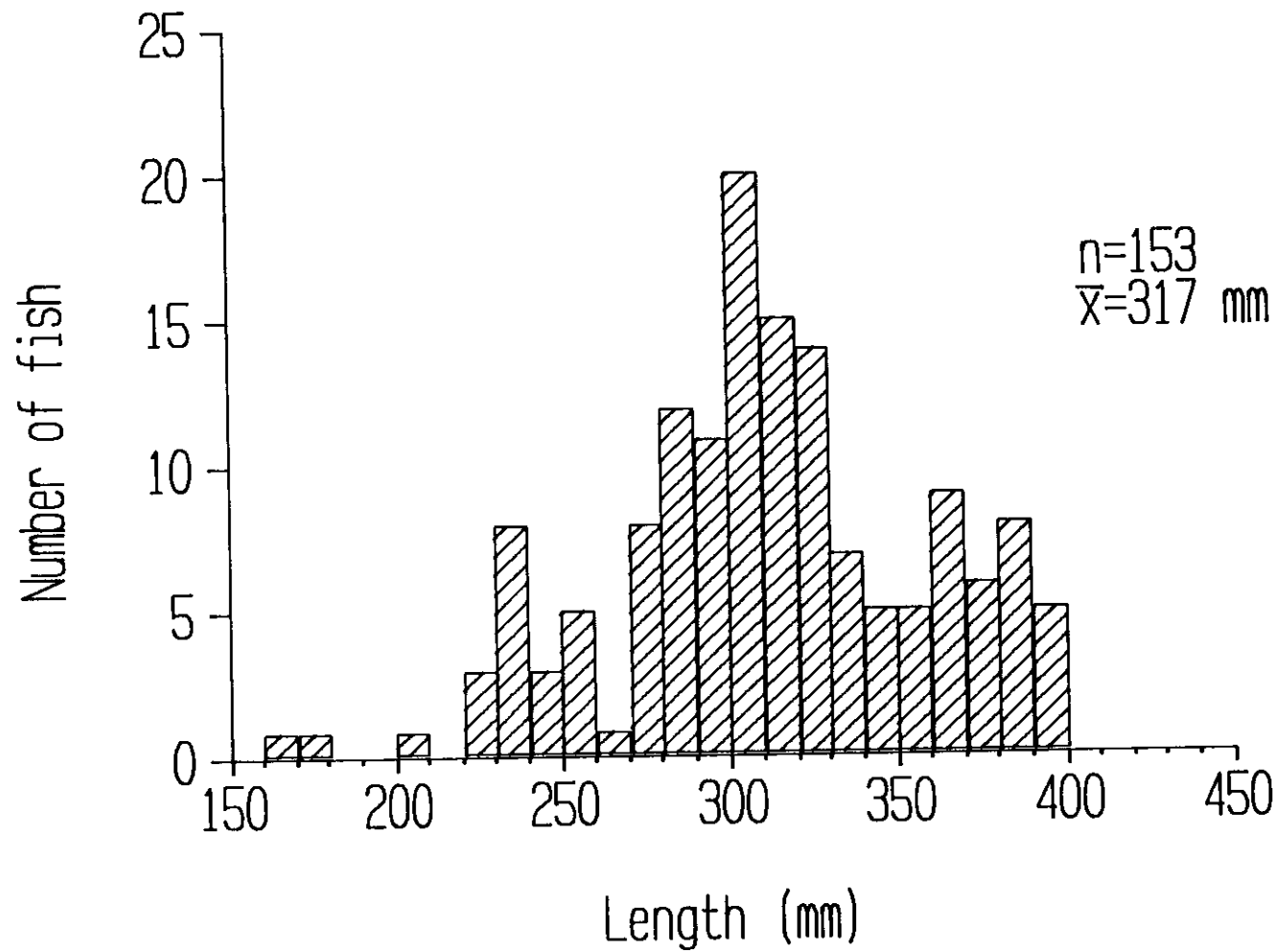


Figure 3. Length frequency of cutthroat trout caught by anglers in the lower Coeur d'Alene River during May and June, 1986.

Table 4. Total trout and cutthroat trout catch rates (fish/hour) for boat and shore anglers, by section and interval, for the Coeur d'Alene River creel survey, 1986.

Section	Intervals						Period totals	
	May 20-June 6		June 7-June 20		June 21-June 30		All trout	Cut-throat
	All trout	Cut-throat	All trout	Cut-throat	All trout	Cut-throat		
1	0.43	0.26	0.23	0.10	0.30	0.15	0.34	0.18
2	0.22	0.22	0.29	0.26	0.13	0.04	0.23	0.21
3	0.36	0.35	0.12	0.12	0.06	0.17	0.29	0.28
Total	0.35	0.32	0.19	0.14	0.20	0.08	0.29	0.25

Table 5. Fish species captured by electrofishing (+) tributaries to the St. Joe and St. Maries rivers, 1986.

Stream	Species observed					
	Cutthroat trout	Rainbow trout	Hybrid RBT-CTT	Brook trout	Bull trout	Other species
Alder Creek	+			+		a,b,c
Benewah Creek	+		+	+		a,b,c,e,f,g
Bond Creek	+			+		a,b,d,e,i
Carlin Creek	+					a
Carpenter Creek	+			+		a,b,e
Cherry Creek	+		+			
Falls Creek	+			+		a
Hugus Creek	+			+		
Mica Creek	+		+	+	+	a,b
Moose Creek	+			+		a
Reeds Gulch	+			+		a
Santa Creek	+					a,b,c,e
Charlie Creek	+			+		a,b,c,e
Hume Creek	+					a
Street Creek	+		+	+		a,i
Thomas Creek	+			+	+	a
Thorn Creek	+		+	+		a,f,g,h,i
Cañon Creek	+					a
Trout Creek	+	+	+	+	+	a

Key: a = sculpin species  
b = dace species  
c = sucker species  
d = northern squawfish  
e = redbside shiner

f = largemouth bass  
g = yellow perch  
h = bullhead catfish species  
i = mountain whitefish

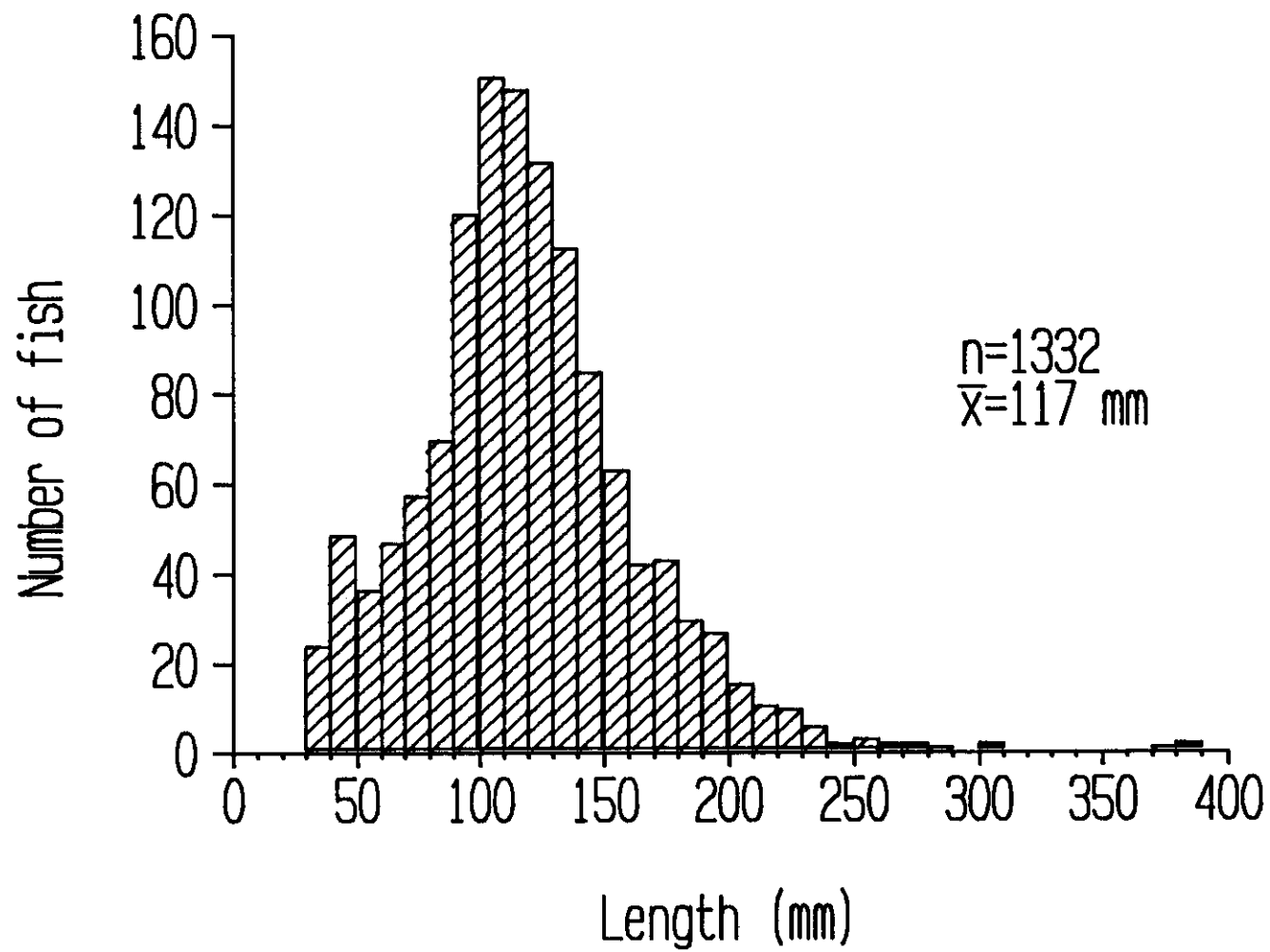


Figure 4. Length frequency of cutthroat trout captured in tributaries of the St. Joe and St. Maries rivers by electrofishing, 1986.

### Snorkeling

In 1986, fish densities varied from 1.0 per 100 m<sup>2</sup> in Mica Creek to 132.5 fish per 100 m<sup>2</sup> in Reeds Gulch (Table 6). Young-of-the-year fish were observed in many transects and are included in the counts. Many small tributaries that were not snorkeled were electrofished during the same period.

### Tributary Trapping

Fyke nets were effective in trapping downstream migrating fish from 10 lower river tributaries. Fish were captured in all tributaries but Whittenburg Draw (Table 7). Only in Thorn and Benewah creeks were substantial numbers of cutthroat trout emigrants captured. The average juvenile from Benewah Creek was 113 mm long (Figure 5) and typically emigrated in its second year of life (1+). Cutthroat trout emigrated from Thorn Creek during their third year (2+) and averaged 137 mm long (Figure 6). Periods of peak outmigration typically coincided with freshets of high discharge during the normal spring migration period (Figure 7).

### Purse Seining

We used a purse seine to capture cutthroat trout, kokanee salmon, and chinook salmon Oncorhynchus tshawytscha in Lake Coeur d'Alene from November 4 to November 7, 1986. Browns Bay, in the southern end of the lake, was the only location where cutthroat trout were captured. All cutthroat trout and both chinook salmon were tagged and released. Of the 39 cutthroat trout tagged with reward tags, 13% had hooking scars from previous capture. The catch is detailed in Table 8.

Mean length of the cutthroat trout in the purse seine sample was 298 mm and kokanee salmon averaged 210 mm. The two chinook salmon were 215 and 234 mm long. Five tags have been returned by anglers, which produced an exploitation rate of 13% for cutthroat trout in Lake Coeur d'Alene.

### Cutthroat Trout Movements

Angler tag recoveries from the St. Joe and Coeur d'Alene rivers have provided evidence of extensive cutthroat trout movements. Only six of the 2,306 fingerling tags were recovered during the last three years, which was probably due to low retention rates. A study is currently underway to determine retention rates for fingerling tags. Jaw-tagged adult trout yielded more returns. In the Coeur d'Alene River drainage, 21 tags were recovered from fish tagged in 1985 and 12 from those tagged during 1986. All fish were recaptured in the river. Fish migrated up to 16 km before being harvested (Table 9).

Table 6. Summary of fish densities (fish/100 m<sup>2</sup>) observed by snorkeling St. Maries and St. Joe river tributaries, 1986.

Stream	Date	Water temp. (C)	Cutthroat trout	Rainbow trout	Hybrid RBT-CTT trout	Unidentified <u>Salmo</u> species	Brook trout	Other fish	Total
<b>Alder Creek</b>									
Site 1	8-28	18.0	3.7	0.0	0.0	0.0	0.0	10.5 <sup>a,b,c</sup>	14.2
Site 2	8-28	20.5	14.2	0.0	0.0	0.0	3.6	11.8 <sup>b</sup>	29.6
<b>Benewah Creek</b>									
Site 1	8-29	19.0	1.4	0.0	0.0	0.0	0.0	83.7 <sup>c,d,e,f</sup>	85.1
Site 2	8-29	18.0	3.2	0.0	0.0	0.0	0.0	135.8 <sup>b,c,d,e</sup>	139.0
Site 3	8-29	17.0	2.7	0.0	0.0	6.8	1.4	2.7 <sup>d</sup>	13.6
<b>Bond Creek</b>									
Site 1	9-11	13.0	1.6	0.0	0.0	0.0	0.5	23.2 <sup>a,b,c,d</sup>	25.3
Site 2	9-11	13.0	4.0	0.0	0.4	0.0	1.2	7.6 <sup>a,b,c,e</sup>	13.2
<b>John's Creek</b>	8-28	21.0	0.7	0.0	0.0	0.0	0.0	1.4 <sup>a,b</sup>	2.1
<b>Mica Creek</b>									
Site 1	8-27	19.0	0.0	2.3	0.4	0.0	0.0	1.5 <sup>a</sup>	4.2
Site 2	8-27	17.0	0.0	0.0	0.5	0.5	0.0	0.0	1.0
Site 3	9-19	12.0	1.9	0.0	0.0	0.0	6.7	0.0	8.6
<b>Reeds Gulch</b>	8-27	13.0	0.0	0.0	0.0	0.0	132.5	0.0	132.5
<b>Trout Creek</b>	9-17	12.0	14.5	0.0	0.8	0.4	0.4	0.8 <sup>b</sup>	16.9

Key: a = northern squawfish  
b = sculpin species  
c = sucker species  
d = reidside shiner  
e = dace species  
f = largemouth bass



Table 7. Number of salmonids and presence (X) of other fish species trapped in St. Joe and St. Maries river tributaries during the spring, 1986.

Stream	Nights fished	Species captured										
		CTT	HYB	BLT	BKT	BBH	YP	RSS	Dace	Sculpin	Sucker	NS
Benewah Creek	8	161	6	0	0	0	0	X	X	X	0	0
Cherry Creek	2	4	0	1	0	0	0	0	0	0	0	0
Hugus Creek	2	0	0	0	0	0	0	X	0	0	0	X
Mica Creek	2	1	1	0	0	0	0	0	0	0	0	0
Reeds Gulch	3	1	0	0	1	0	0	0	0	0	0	0
Street Creek	2	1	0	0	4	0	0	0	0	0	0	0
Thomas Creek	2	1	2	0	0	0	0	0	0	0	0	0
Thorn Creek	8	33	0	1	1	X	X	0	X	X	X	0
Trout Creek	1	1	1	0	0	0	0	0	0	0	0	0
Whittenburg Draw	2	0	0	0	0	0	0	0	0	0	0	0

Key: CTT = cutthroat trout  
 HYB = rainbow-cutthroat hybrid trout  
 BLT = bull trout  
 BKT = brook trout  
 BBH = bullhead catfish species  
 YP = yellow perch  
 RSS = redbside shiner  
 Dace = dace species  
 Sculpin = sculpin species  
 NS = northern squawfish

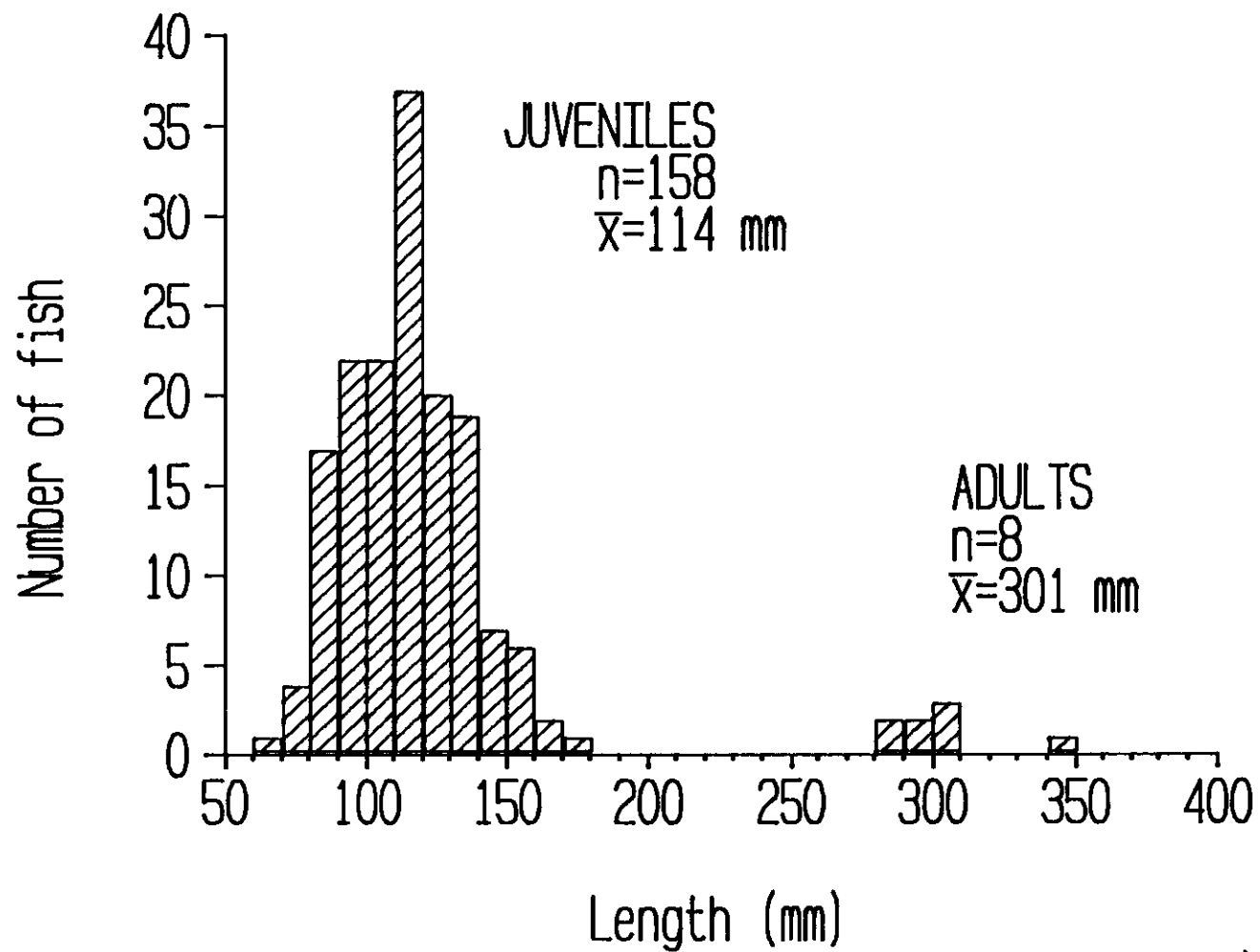


Figure 5. Length frequency of cutthroat trout captured with fyke nets from Benewah Creek from April to June, 1986.

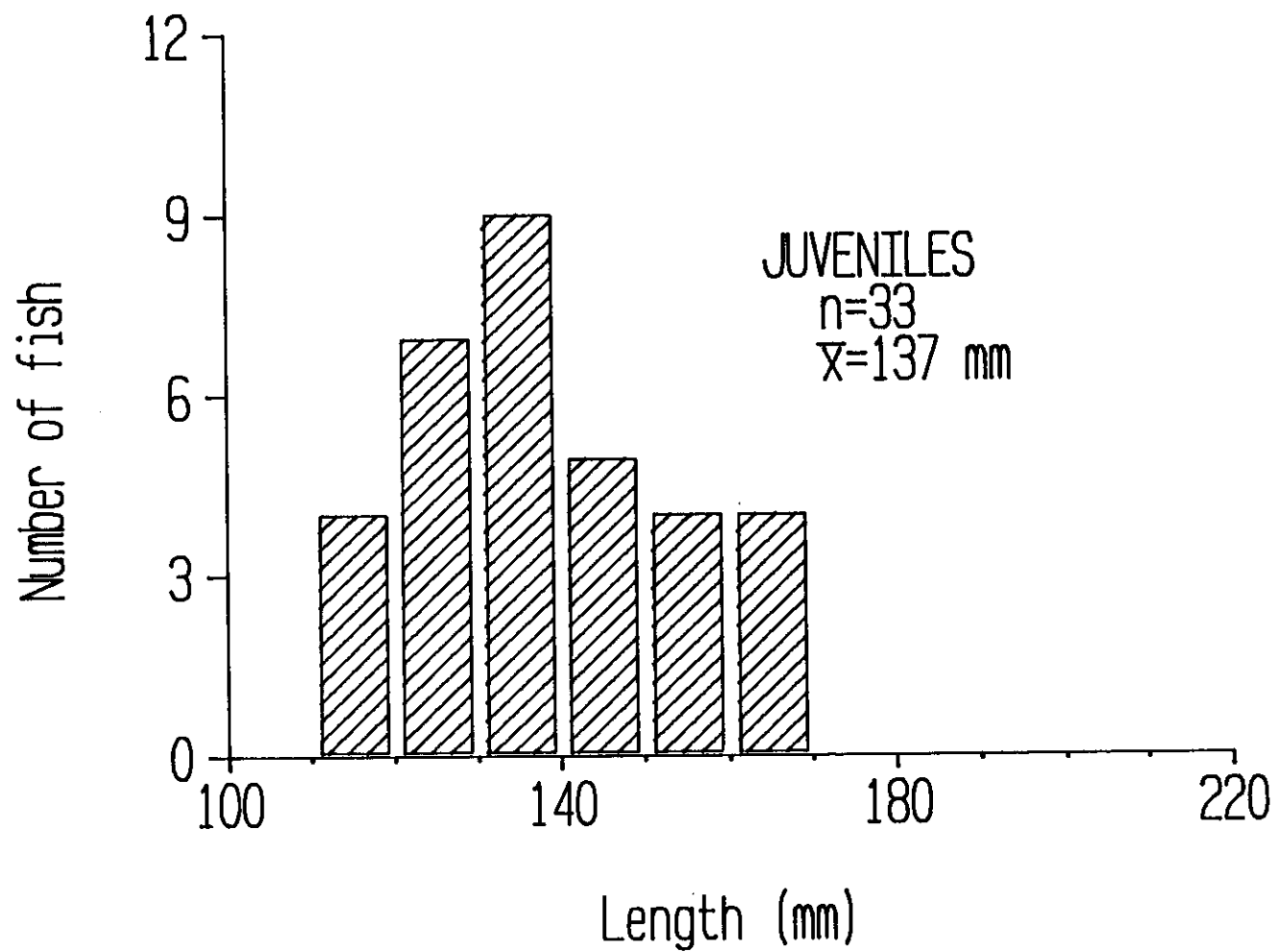


Figure 6. Length frequency of cutthroat trout captured in fyke nets from Thorn Creek from April to June, 1986.

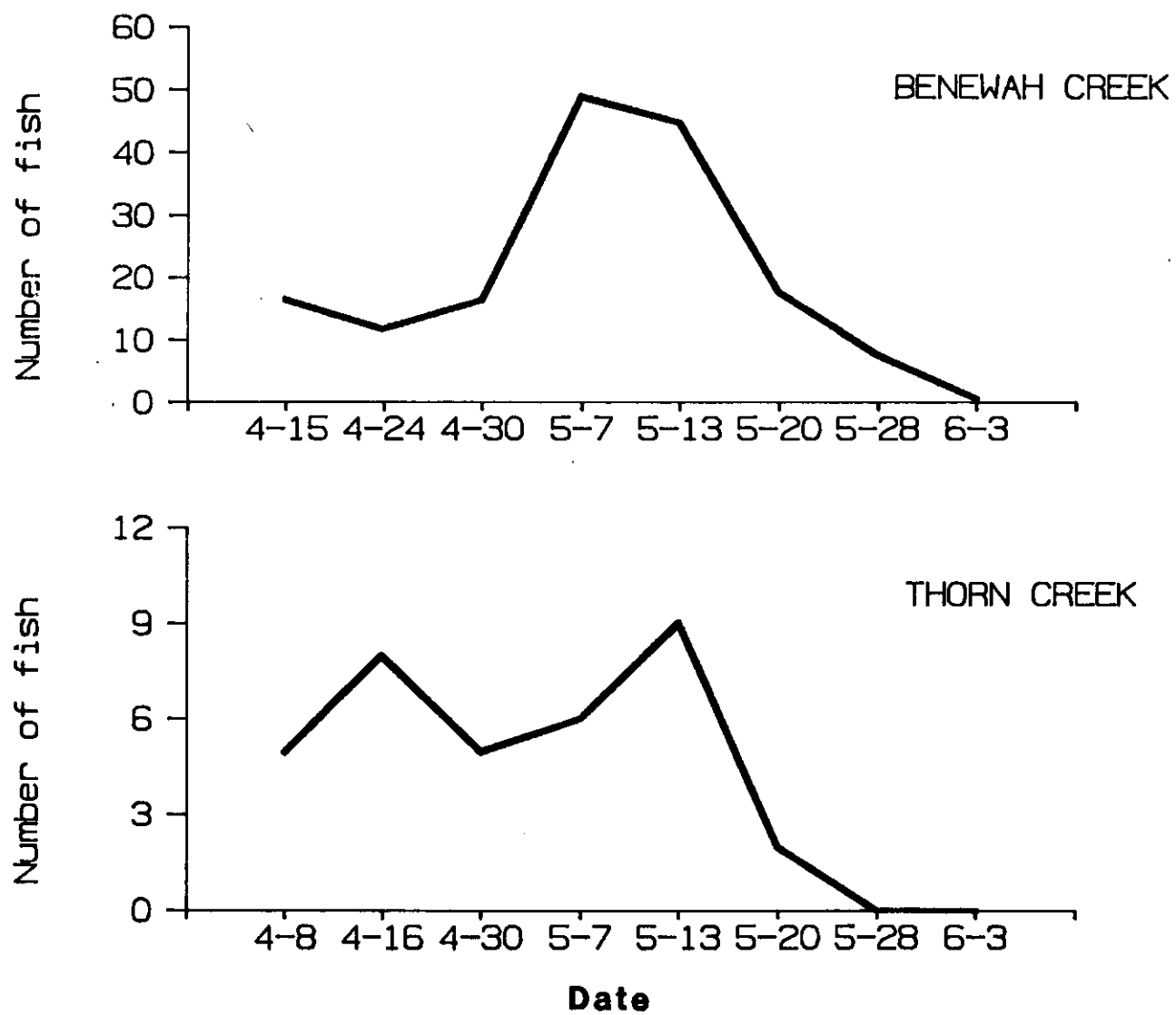


Figure 7. Timing of cutthroat trout emigration from Benewah and Thorn creeks during spring, 1986.

Table 8. Fish captured with purse seine gear from Lake Coeur d'Alene during November, 1986.

Date	Location	Species caught			Total
		Cutthroat trout	Kokanee salmon	Chinook salmon	
11-4	Browns Bay	0	80	0	80
11-4	Browns Bay	5	307	1	313
11-4	Browns Bay	14	162	1	177
11-4	Browns Bay	11	27	0	38
11-5	Cleland Bay	0	0	0	0
11-5	Cleland Bay	0	1	0	1
11-5	Cleland Bay	0	1	0	1
11-5	Browns Bay	3	40	0	43
11-5	Browns Bay	2	242	0	244
11-5	Browns Bay	5	20	0	25
11-6	16 to 1 Point	0	0	0	0
11-6	Windy Bay	0	0	0	0
11-6	Windy Bay	0	0	0	0
11-6	Powderhorn Bay	0	450	0	450
11-7	Lofts Bay	0	0	0	0
11-7	1 km N. Lofts Bay	0	0	0	0
11-7	Mica Bay	0	0	0	0
11-7	Mica Bay	0	0	0	0
11-7	Mica Bay	0	150	0	150
11-7	Tubbs Hill	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
	Totals	40	1,480	2	1,522

Table 9. Movement of tagged cutthroat trout in the Coeur d'Alene River.

Tag type <sup>a</sup> & number	Date tagged	Location tagged	Date recovered	Location recovered	Total length when tagged (mm)	Total length when recovered (mm)	Direction and distance moved
JT C10703	5/9/86	River @ Mission	9/3/86	River @ Mission	372	419	No movement
JT C10796	10/13/86	River @ Cataldo	5/25/87	River @ Cataldo	405	559	No movement
JT F0047	5/16/86	River @ Mission	5/24/86	River @ Mission	368	368	No movement
JT F0076	5/1/86	River @ Cataldo	6/7/86	River @ Cataldo	346	368	No movement
JT J0889	7/1/86	River at Cataldo	5/23/87	River @ Cataldo	240	unknown	No movement
JT J0905	9/20/86	River @ Cinnamon Cr.	6/6/87	River @ Kit Price	320	356	16 km downstream
JT R0101	5/1/86	River @ Cataldo	6/5/86	River @ Cataldo	300	330	No movement
JT R0115	5/22/86	River @ Cataldo	5/24/86	River @ Dudley	282	282	8 km downstream
JT R0116	5/22/86	River @ Cataldo	5/24/86	River @ Dudley	288	288	8 km downstream
JT R0128	5/22/86	River @ Cataldo	6/6/87	River @ Cataldo	310	unknown	No movement
JT R0137	6/17/86	River @ Enaville	6/17/87	River @ Enaville	295	unknown	No movement
JT R0140	7/1/86	River @ Cataldo	5/23/87	River @ Cataldo	295	330	No movement

<sup>a</sup>JT = monel jaw tag; JT R = aluminum reward jaw tag.

Of the 90 trout tagged with metal jaw tags during 1986 in the St. Joe and St. Maries river systems, 14 were recovered. Postspawning outmigrants from Benewah Creek were caught by anglers in Lake Coeur d'Alene, confirming the adfluvial stock status described by Averett (1962). One cutthroat trout tagged by project anglers near Trout Creek traveled upstream nearly 64 km before being caught by an angler (Table 10). We estimated a minimum exploitation rate of 13.1% from jaw tag returns.

## DISCUSSION

The 1986 creel survey was conducted only during the spring because peak angling activity was observed during this period in 1984 and 1985. During the summer, catch rates declined and effort decreased. The extent of the summer-fall fishery is unknown and we suggest future management direction include a complete season survey. Because of the relatively high cutthroat trout catch rates and the concern over stock viability, a reduced cutthroat trout harvest should be considered as a future management alternative. Either a delayed seasonal opener (July 1) or a minimum size and reduced bag may be appropriate. The delayed opener would be most effective, but would result in the loss of a popular local fishery with over 10,000 hours of effort expended. Drift boat fishing in Section 3 accounted for over half the estimated cutthroat trout harvest (924 of 1767) with 820 taken during the first two weeks of the season. By the end of June, reduced water levels nearly eliminated boat use. From 1985 tag returns, an estimated 32% of postspawning cutthroat trout were harvested.

Length at first spawning has not been determined for this stock of cutthroat trout. Lewynsky and Bjornn (1983) suggest that the 330 mm minimum size set for the St. Joe River does not protect faster-growing Coeur d'Alene River cutthroat trout through one spawning opportunity. If most of the adults captured in the spring trapping in 1985 are first time spawners (scale analysis indicates this), then a 350 mm minimum length would protect most spawners.

Anglers fishing for kokanee salmon in Section 3 suggest that kokanee numbers have decreased dramatically in the last few years. No quantitative data is available; but if the decline is real, the cause may be due to predation by chinook salmon introduced into the lake (Horner et al. 1986).

The stocking of hatchery rainbow trout has had a significant impact on the fishery of the lower North Fork Coeur d'Alene River and the Coeur d'Alene River near the confluence. Populations of natural rainbow and hybridized rainbow-cutthroat trout have contributed to the fishery. The large hybrids are a desirable fish from the angler's viewpoint. Continued stocking of hatchery rainbow trout may pose a threat to cutthroat trout populations if desirable traits are altered by hybridization. This aspect should also be considered in future management decisions for the lower Coeur d'Alene River.

Table 10. Movement of tagged cutthroat trout in the St. Joe and St. Maries river drainages.

Tag type <sup>a</sup> & number	Date tagged	Location tagged	Date recovered	Location recovered	Total length when tagged (mm)	Total length when recovered (mm)	Direction and distance moved
FT-G 497	7/10/86	Cherry Cr.	6/12/87	Cherry Cr.	150	unknown	No movement
JT C10726	10/23/86	River @ Moose Cr.	10/27/86	River @ Big Eddy	378	378	6 km downstream
JT F0003	4/15/86	Benewah Cr.	5/28/86	Chatcolet Lake	345	345	19 km downstream
JT F0052	4/30/86	Benewah Cr.	6/1/86	Chatcolet Lake	302	320	13 km downstream
JT F0061	6/2/86	River @ Bond Cr.	6/?/86	River @ Bond Cr.	332	332	No movement
JT F0063	10/23/86	River @ Big Eddy	6/?/87	River @ Avery	373	unknown	27 km upstream
JT F0082	4/30/86	River @ Big Eddy	6/15/86	River @ Avery	282	290	27 km upstream
JT J0909	10/6/86	River @ Simmons Cr.	6/17/87	River @ Avery	233	305	32 km downstream
JT J0918 <sup>b</sup>	7/31/86	Mica Cr.	5/23/87	River @ Falls Cr.	245	285	14 km downstream
JT J0926	6/2/86	River @ Bond Cr.	6/?/87	River @ HUGus Cr.	257	unknown	11 km upstream
JT J0935	10/23/86	River @ Big Eddy	6/24/87	River @ Avery	260	267	31 km upstream
JT R0144	10/24/86	River @ Calder	7/4/87	River @ Big Cr.	297	unknown	No movement
JT R0145	10/23/86	River @ Big Eddy	8/16/87	Bear Cr.	234	279	64 km upstream
FT-B 546	8/19/86	Alder Cr.	5/31/87	Alder Cr.	156	210	No movement

<sup>a</sup>FT = Floy fingerling tag; JT = monel jaw tag; JT R = aluminum reward jaw tag.

<sup>b</sup>RBT x CTT hybrid



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## APPENDICES

Appendix A. Estimated effort by section, interval, and day-type for boat and shore anglers fishing the Coeur d'Alene River, May 24 to June 30, 1986.

Interval	Day-type	Section 1			Section 2			Section 3			Total
		Boat	Shore	Total	Boat	Shore	Total	Boat	Shore	Total	
1	Weekdays	72	288	360	0	240	240	528	576	1,104	1,705
1	Weekends	169	1,102	1,271	98	729	826	1,254	934	2,187	4,285
2	Weekdays	90	622	712	35	445	480	462	390	853	2,045
2	Weekends	22	437	459	107	203	310	309	288	597	1,366
3	Weekdays	128	64	192	0	96	96	0	256	256	544
3	Weekends	22	246	268	43	235	278	54	118	172	717
Total	Weekdays	289	975	1,264	35	781	816	991	1,223	2,214	4,294
Total	Weekends	212	1,785	1,998	247	1,167	1,414	1,616	1,339	2,956	6,367

Appendix B. Angler harvest by species, section, and interval for the Coeur d'Alene River creel survey, 1986.

Section	Angling method	Interval 1						Total
		Cutthroat trout	RBT-CTT hybrid trout	Natural rainbow trout	Hatchery rainbow trout	Brook trout	Kokanee salmon	
1	boat	29	5	0	34	0	0	68
	shore	167	28	0	195	0	0	390
2	boat	11	1	0	0	0	0	12
	shore	107	10	0	0	0	0	117
3	boat	820	18	7	7	18	36	906
	shore	106	15	6	6	15	60	208
Total:	boat	860	24	7	41	18	36	986
	shore	380	53	6	201	15	60	715
Section	Angling method	Interval 2						Total
		Cutthroat trout	RBT-CTT hybrid trout	Natural rainbow trout	Hatchery rainbow trout	Brook trout	Kokanee salmon	
1	boat	9	0	3	10	0	0	22
	shore	85	0	32	95	0	0	212
2	boat	7	7	0	0	7	54	75
	shore	175	32	0	0	13	13	233
3	boat	100	0	0	0	0	178	278
	shore	75	0	0	0	0	191	266
Total:	boat	116	7	3	10	7	232	375
	shore	335	32	32	95	13	204	711
Section	Angling method	Interval 3						Total
		Cutthroat trout	RBT-CTT hybrid trout	Natural rainbow trout	Hatchery rainbow trout	Brook trout	Kokanee salmon	
1	boat	15	0	7	7	0	0	29
	shore	31	0	16	16	0	0	63
2	boat	0	2	0	0	2	24	28
	shore	0	13	0	0	13	189	215
3	boat	4	0	4	4	0	0	12
	shore	26	0	26	26	0	0	78
Total:	boat	19	2	11	11	2	24	69
	shore	57	13	42	42	13	189	356

Appendix C. Daily catch and effort by section for the Coeur d'Alene River creel survey, 1986.

Date	Anglers	Hours	Catch			Total
		fished	CTT	RBT	BKT	
<u>Section 1</u>						
5-24	15	41.50	11	7	3	21
5-25	31	28.50	13	2	0	15
5-30	1	4.75	0	0	0	0
6-1	14	13.50	0	5	0	5
6-6	5	15.00	3	0	0	3
6-7	19	40.75	4	1	0	5
6-10	5	5.00	2	4	0	6
6-12	10	8.50	0	2	0	2
6-15	8	6.50	0	0	0	0
6-16	14	21.00	2	4	0	6
6-22	13	13.25	2	1	0	3
6-25	1	2.00	1	2	0	3
6-28	3	5.00	0	—	—	—
Subtotal	139	205.25	38	28	3	69
<u>Section 2</u>						
5-24	20	18.25	14	0	0	14
5-25	17	46.75	1	0	0	1
5-30	0	—	—	—	—	—
6-1	7	8.00	1	0	0	1
6-6	5	12.75	1	0	0	1
6-7	3	14.25	5	0	0	5
6-10	3	5.00	8	0	0	8
6-12	9	15.00	1	0	1	2
6-15	15	24.75	2	0	1	3
6-16	4	3.75	0	0	0	0
6-22	14	12.00	1	0	0	1
6-25	12	8.50	0	0	1	1
6-28	3	2.25	0	1	0	1
Subtotal	112	179.75	34	1	3	38
<u>Section 3</u>						
5-24	32	123.75	46	0	2	48
5-25	54	149.00	51	0	1	52
5-30	6	14.50	19	0	0	19
6-1	22	61.50	17	1	1	19
6-6	23	41.25	3	1	0	4
6-7	11	43.75	8	0	0	8
6-10	13	11.25	0	0	0	0
6-12	14	38.00	3	0	0	3
6-15	13	49.00	7	0	0	7
6-16	6	9.00	1	0	0	1
6-22	4	5.50	1	2	0	3
6-25	6	8.00	0	0	0	0
6-28	2	4.00	0	0	0	0
Subtotal	206	558.50	156	4	4	164

## JOB PERFORMANCE REPORT

State of: Idaho

Name: RIVER AND STREAM  
INVESTIGATIONS

Project No.: F-73-R-9

Title: North Idaho Stream  
Fishery Research

Subproject No.: IV

Study No.: IV

Job No.: 2. Fish Habitat Description

Period Covered: March 1, 1986 to February 28, 1987

## ABSTRACT

A fisheries habitat evaluation methodology developed by personnel from the U.S. Forest Service, Idaho Panhandle National Forest, was utilized to survey streams on the lower St. Joe and St. Maries rivers. Use of this stream survey system will allow comparison of habitat in 14 study streams (21 reaches) with many other streams surveyed by Forest Service and Department personnel throughout northern Idaho. Parameters surveyed include stream order, elevation, gradient, valley bottom and channel type, temperature, habitat type, cover components, and spawning sites.

Author:

William D. Horton  
Senior Fishery Research Biologist



## **INTRODUCTION**

An integral component of fish population assessment is an evaluation of the habitat. To assess the stream habitat, a cost effective, time efficient, and simple inventory survey was needed to meet project objectives. Habitat degradation from road building, timber harvest, agricultural practices, stream encroachment, garnet mining, and high runoff in recent years has occurred throughout the St. Joe and St. Maries river drainages. In 1985, the habitat survey methodology used by the U.S. Forest Service was selected for evaluation of the fish habitat. This method was developed and used by Idaho Panhandle National Forest personnel (E. Lider and R. Rainville, U.S. Forest Service, unpublished documents) over the last five years on several drainages in northern Idaho. Their work is a modification of stream survey methods described by Duff and Cooper (1978).

## **OBJECTIVES**

To evaluate fish habitat and identify factors which may limit production of salmonids in the lower St. Joe and St. Maries river systems.

## **RECOMMENDATION**

Develop a systematic approach to surveying habitat on some streams each year to create a usable database for fishery management.

## **METHODS**

The habitat survey used for this project is the Idaho Panhandle National Forest method. A stream survey starts by identifying stream reaches on U.S. Geological Survey 7.5 minute topographic maps; but, a more refined division of stream reaches is done on-site if necessary when the stream is being surveyed. Lider and Rainville (unpublished documents) define a reach as "a section of stream which has the same potential for biological production and physical alteration." It should have similar gradient, valley bottom, stream order (discharge), and be at least 0.4 km long.

Information was recorded on survey maps and standard survey forms (Appendix A). Stream reaches, fish migration barriers, sediment sources (slumps, slides, etc.), channel braiding, dry stream channel sections, and actual segments surveyed were marked on maps. The survey form was used to record all field information and was later transferred to the U.S. Forest Service Data General Computer for further analysis. This included topographical information, physical characteristics and miscellaneous

comments. Specifically, the following was recorded for each stream reach: valley bottom type, channel type, stream order, temperature, habitat type, gradient, spawning sites, pool creators, spawning site creators, and cover components. Additional information was gathered by Forest Service personnel. Some of this information was used to develop habitat improvement projects, help define guidelines for timber harvest, and to maintain background information for land management needs (E. Lider, personal communication).

To reduce bias inherent with ocular surveys, this methodology randomized distances to survey sites using a random number table and required that measurements be made to classify components of habitat types. Pools were divided into four classes using depth, cover, and area factors. Other habitat types had to fall within defined physical characteristics to be classed as pocketwater, run, glide, or riffle. Cover (large organic material, boulders, undercut banks, and overhanging vegetation) was measured to determine percentages for all habitat types except riffles. All gradients were measured on-site with a clinometer. All distance measurements were recorded in English units. After information was processed through the U.S. Forest Service computer, a printout of the fisheries habitat summary and various habitat conditions was created.

## **RESULTS**

In the summer and fall of 1986, the fisheries habitat in 21 reaches of 14 streams was surveyed (Figure 1). The proportion of pool, run, pocket-water, and riffle habitat types for each stream reach is shown in Figures 2 through 7. A summary of habitat surveys for each stream is listed in Tables 1 through 21. The summaries are taken from information generated by the Data General Computer at the Panhandle National Forest Office in Coeur d'Alene. The computer printout details all data collected during the survey and identifies habitat components, pool creators, spawning site creators, and stream cover percentages. This information is valuable, but is too cumbersome for inclusion in this report. A sample computer printout is found in Appendix B.

## **DISCUSSION**

Evaluation of stream or fish habitat is a subjective process. Subjectivity is encountered in gathering data, interpretation of definitions that describe habitat types, and the variability among users. The Idaho Panhandle National Forest method addressed subjectivity well and several on-site workshops with methodology developers (Lider and Rainville, personal communication) have addressed interpretation and user variability problems. Continued use and refinement will further reduce subjectivity.

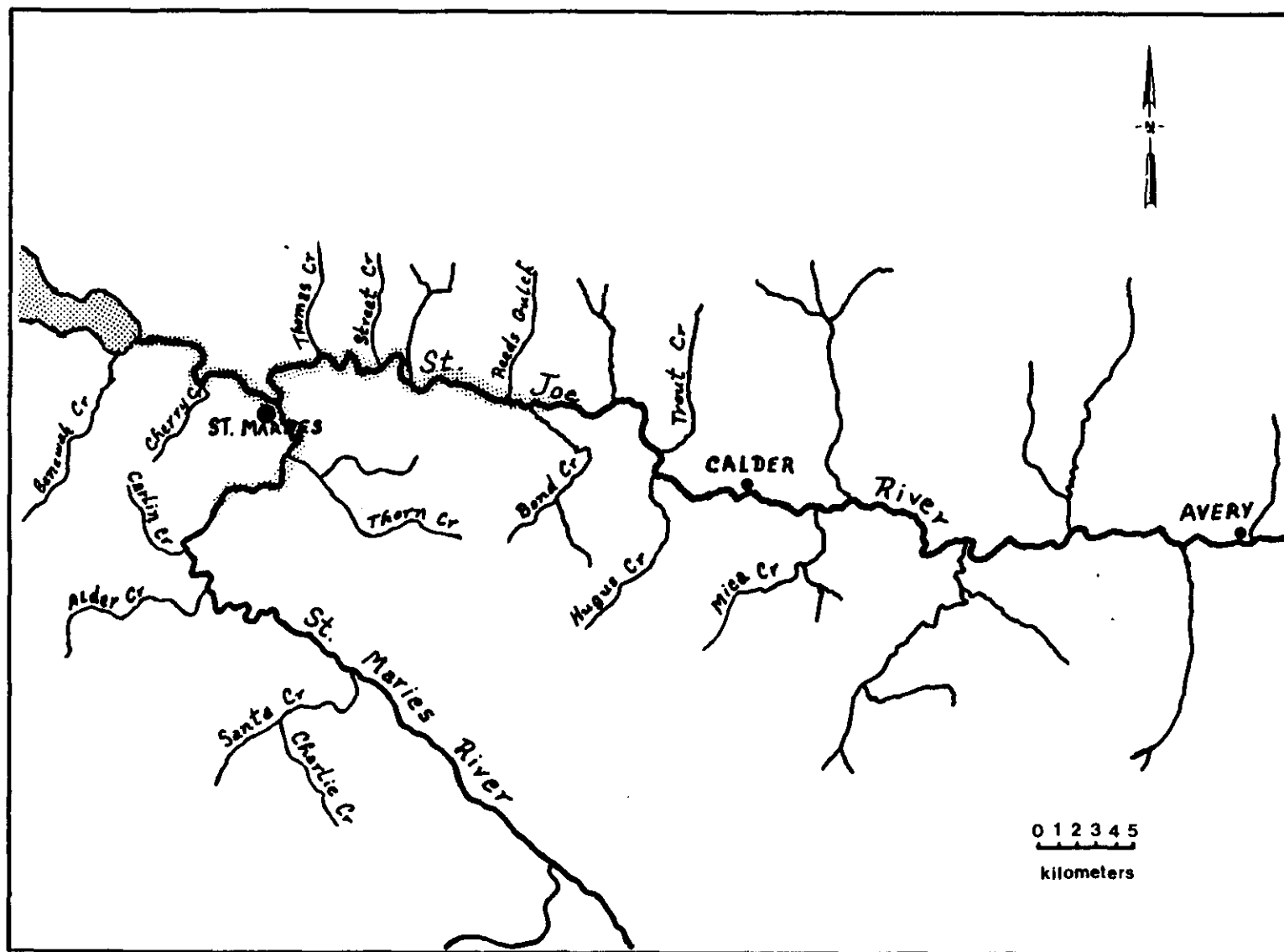


Figure 1. Location of tributaries to the St. Joe and St. Maries rivers where habitat surveys were completed, 1986.

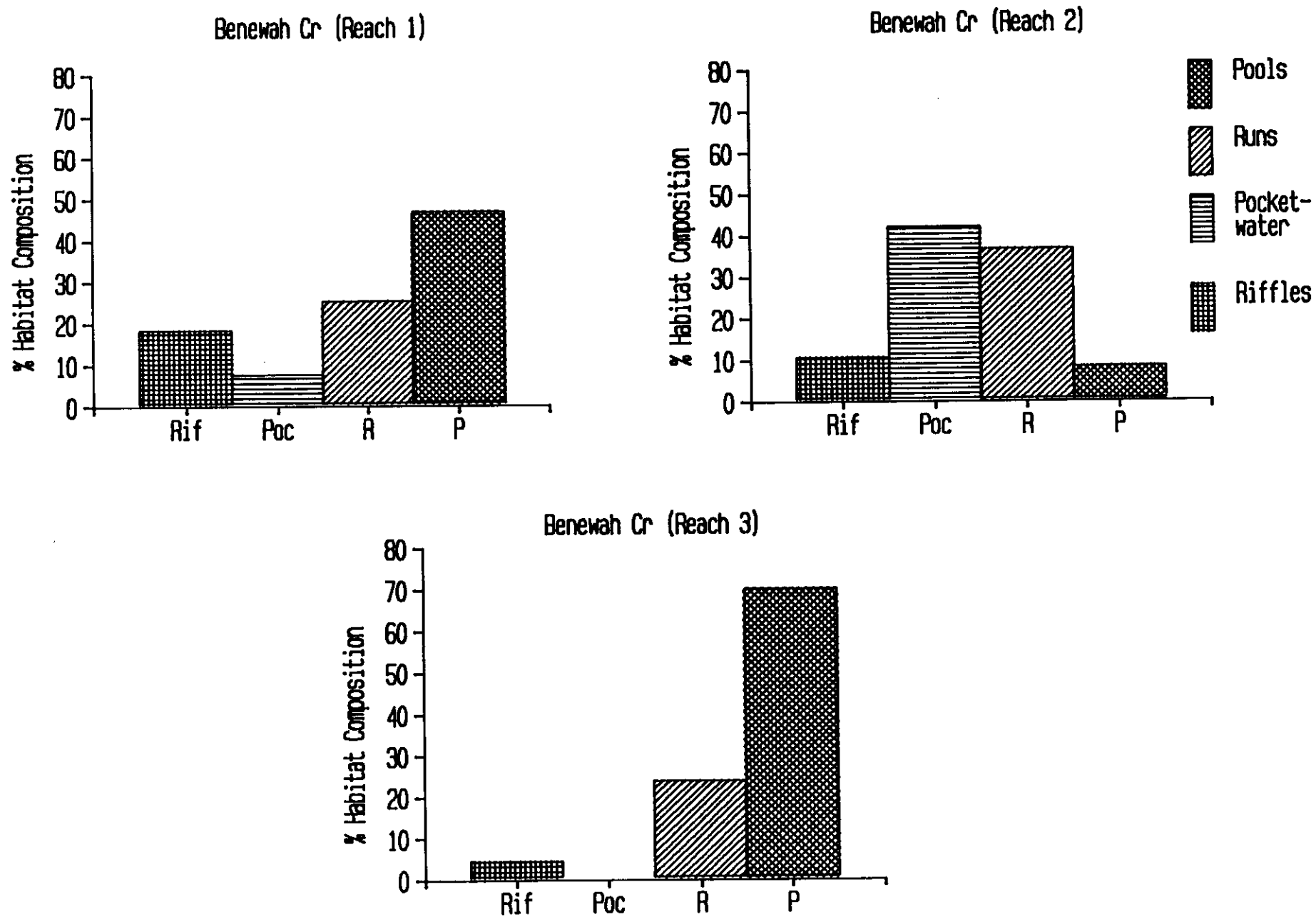


Figure 2. The proportion of four habitat types in Benewah Creek, 1986.

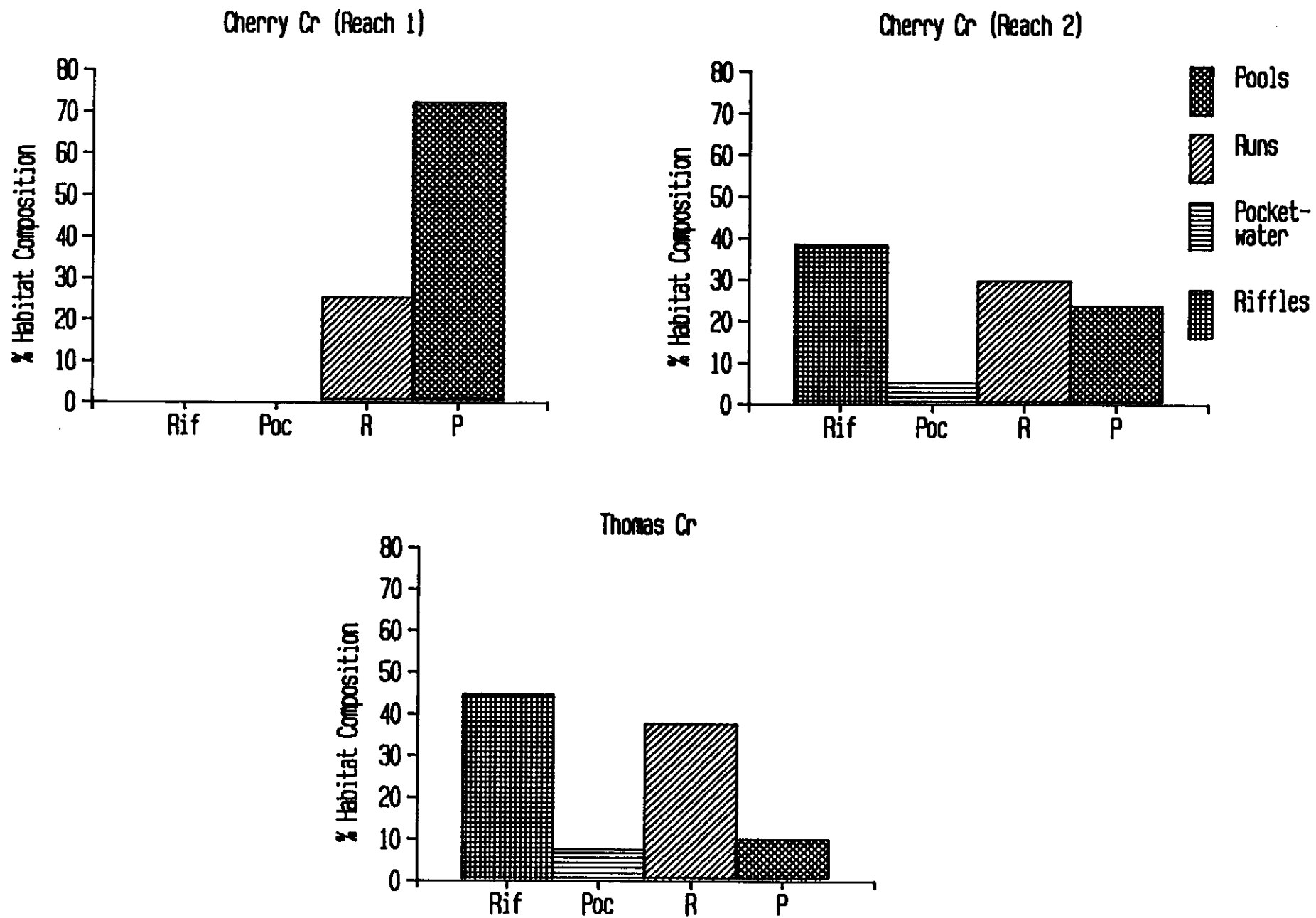


Figure 3. The proportion of four habitat types in Cherry and Thomas creeks, 1986.

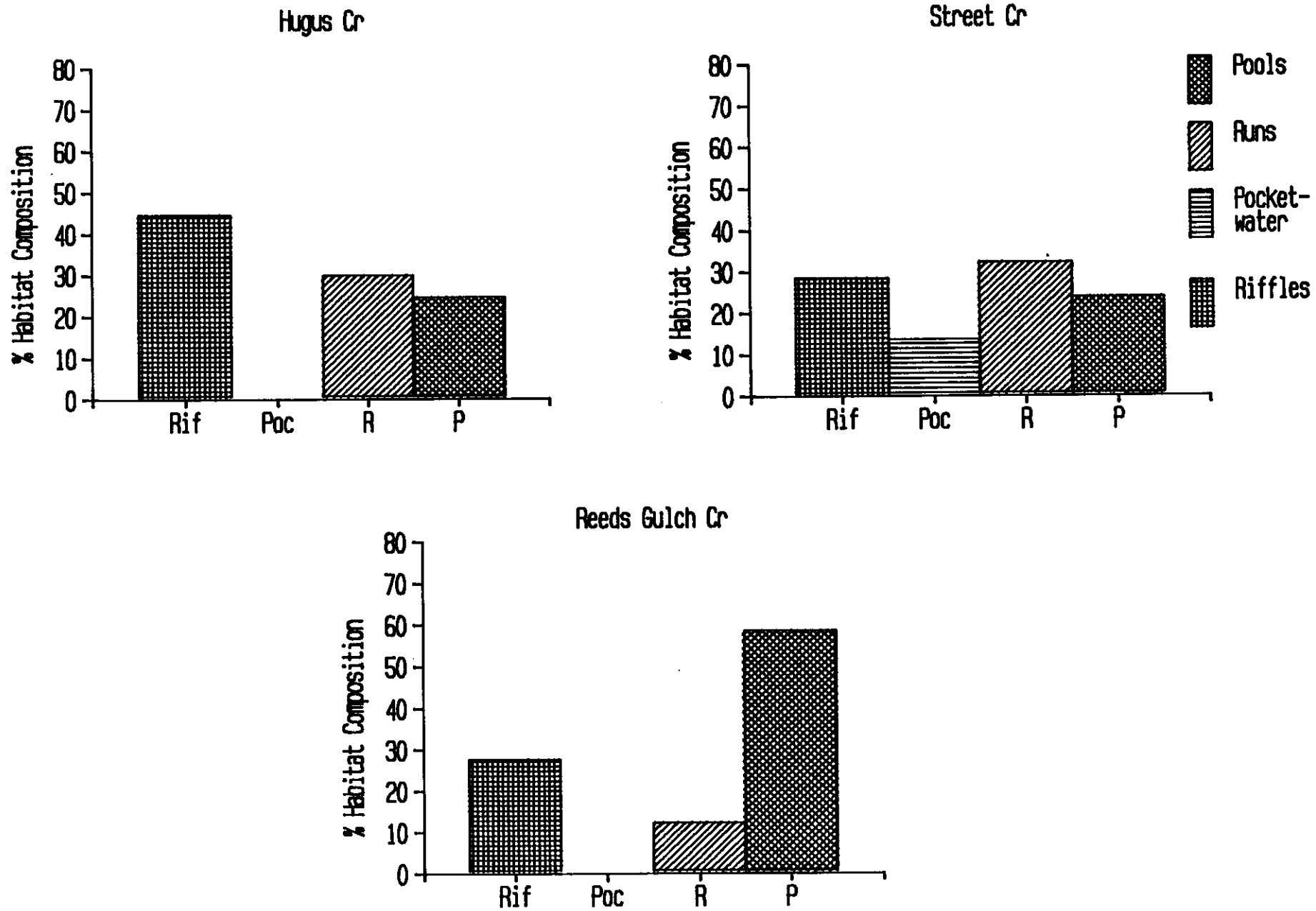


Figure 4. The proportion of four habitat types in Hugus, Street and Reeds Gulch creeks, 1986.

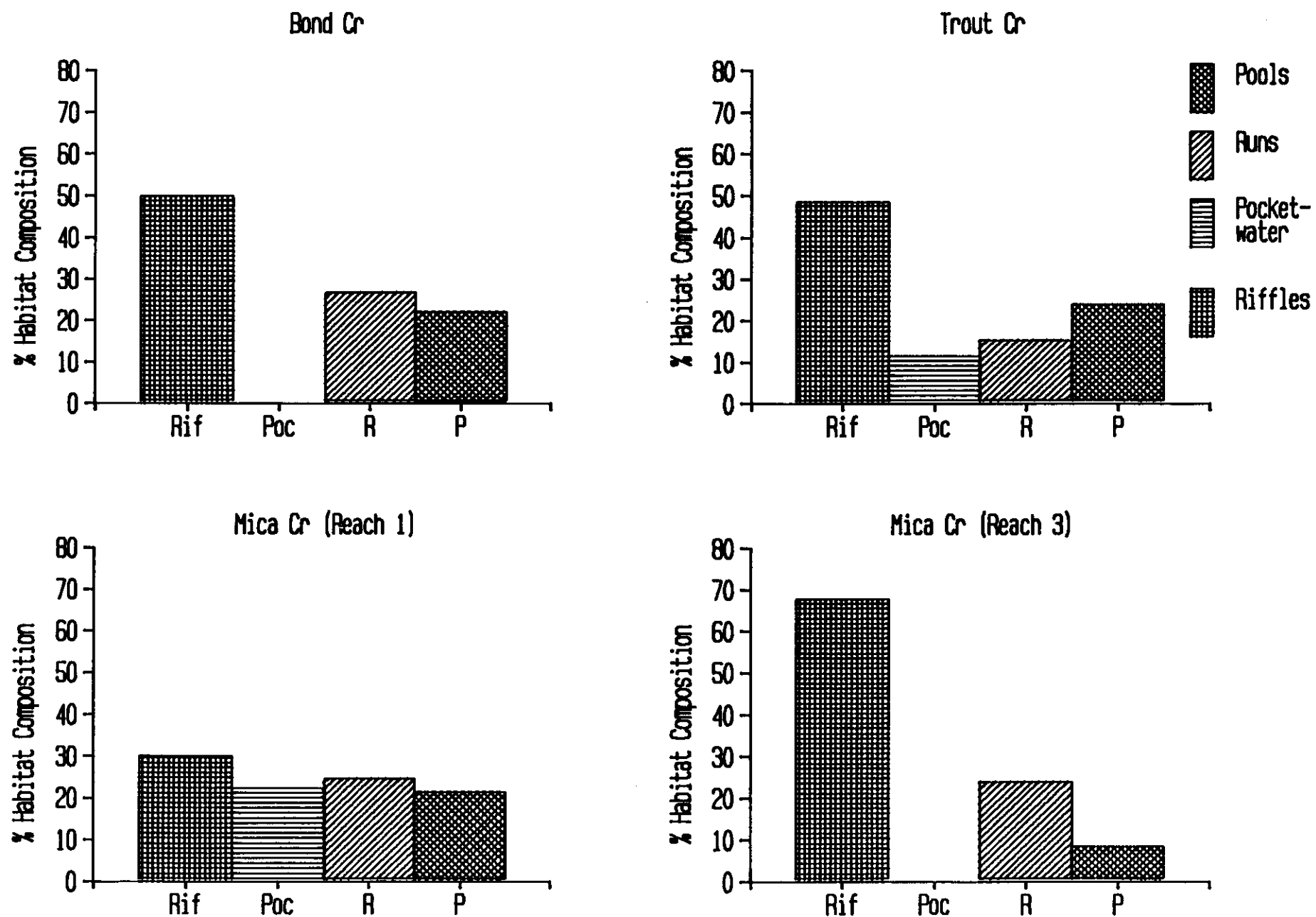


Figure 5. The proportion of four habitat types in Bond, Trout and Mica creeks, 1986.

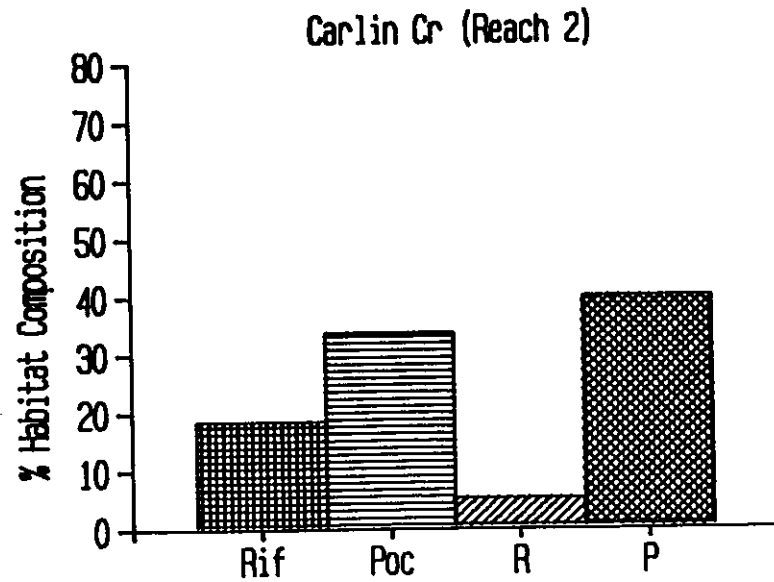
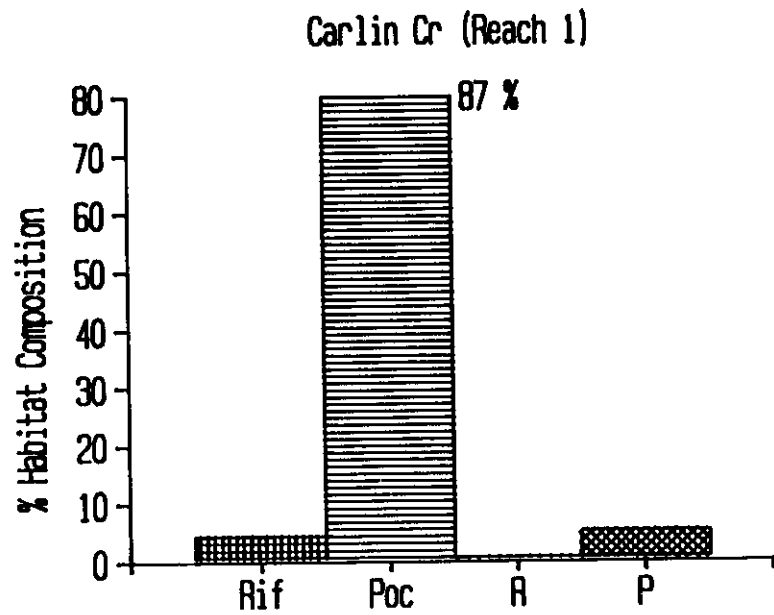
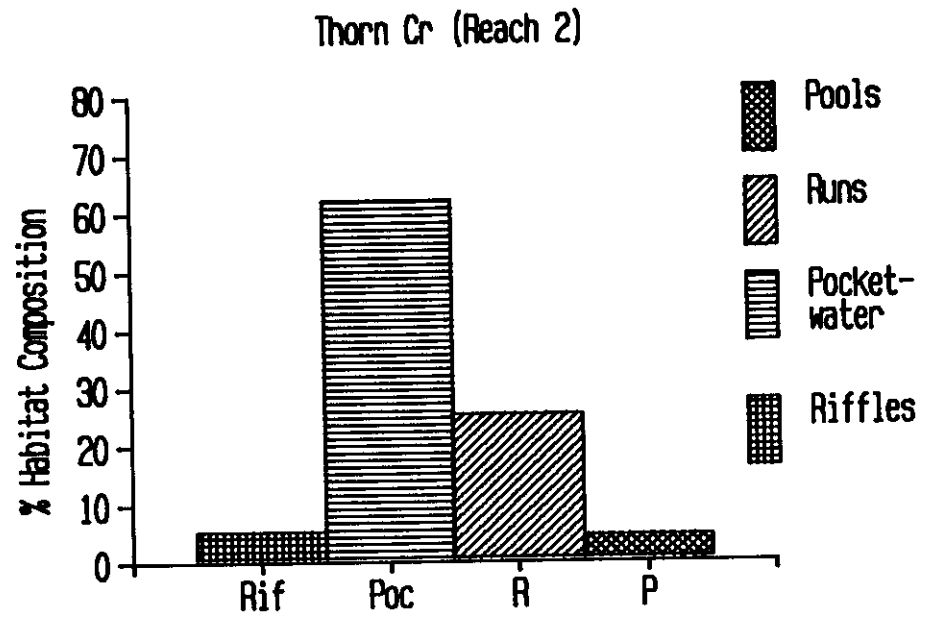
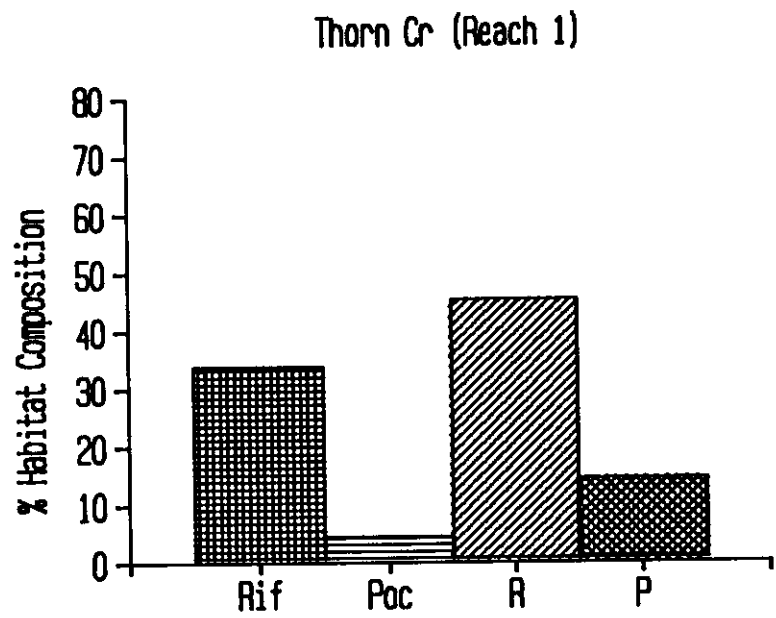


Figure 6. The proportion of four habitat types in Thorn and Carlin creeks, 1986.



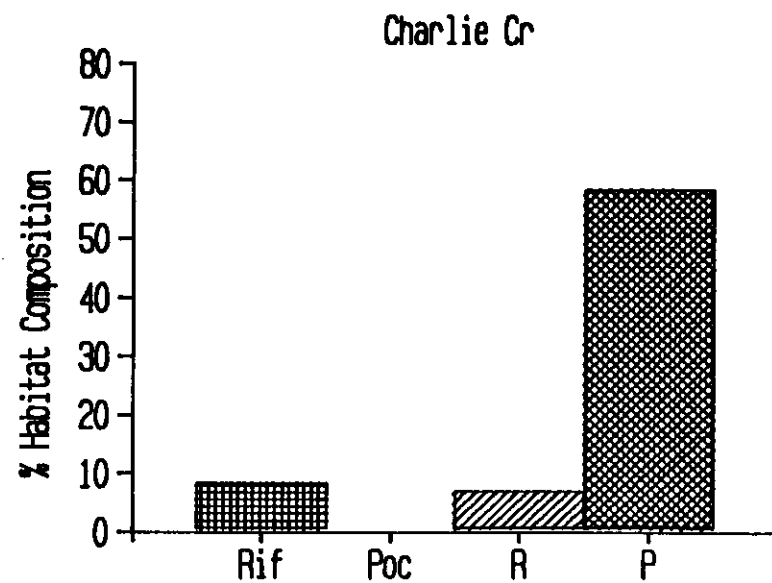
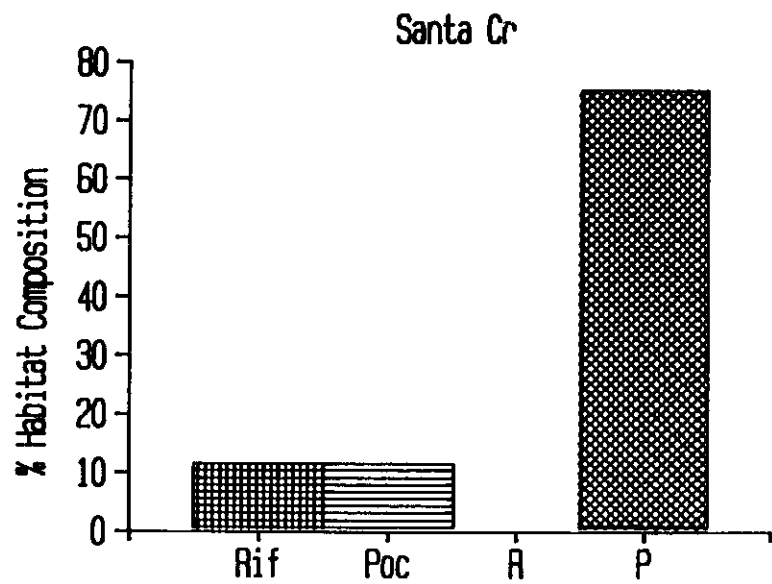
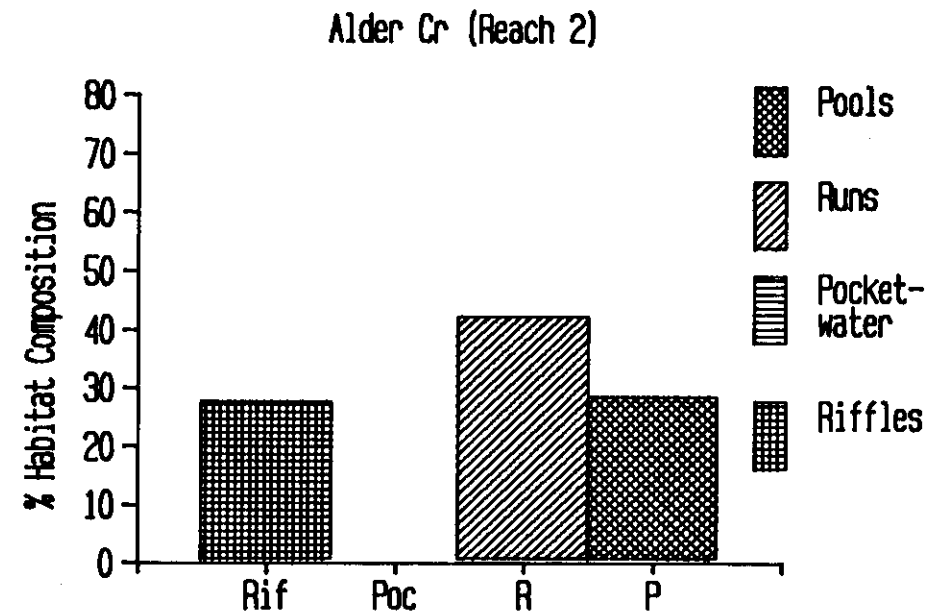
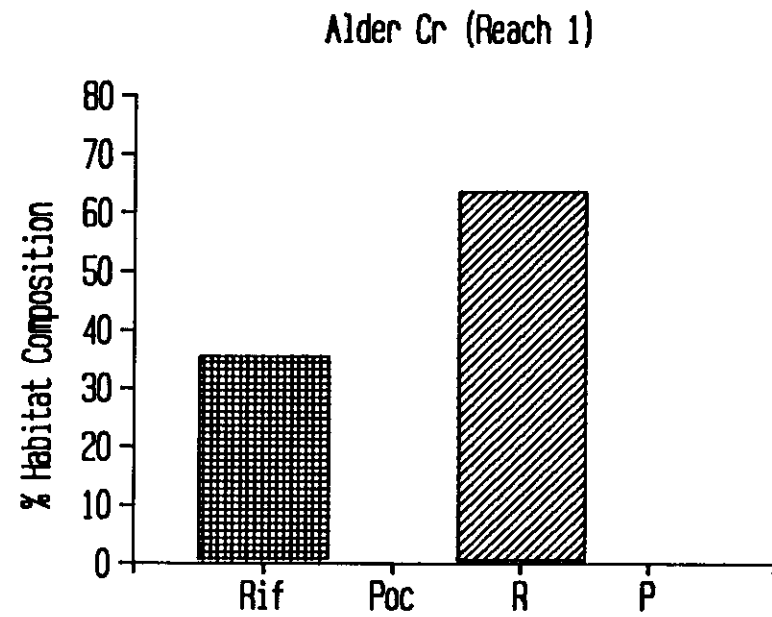


Figure 7. The proportion of four habitat types in Alder, Santa and Charlie creeks, 1986.

Table 1. Summary of stream habitat survey for Benewah Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Benewah Creek  
Stream reach: 01  
Survey date: July 9, 1986  
Starting elevation: 2,128 ft.  
Ending elevation: 2,160 ft.  
Reach distance: 3,050 ft.  
Average gradient: 2%  
Maximum gradient: 2%  
Minimum gradient: 1%  
Average width of reach: 17 ft.  
Total surveyed length: 701 ft.  
Stream habitat in pools: 47%  
    Class 1 pools: 16%  
    Class 2 pools: 26%  
    Class 3 pools: 5%  
    Class 4 pools: 0%  
Stream habitat in runs: 26%  
Stream habitat in riffles: 19%  
Stream habitat in pocketwater: 08%  
Spawning sites surveyed: 0  
Total stream cover: 31%  
    Large organic material: 13%  
    Boulders: 10%  
    Undercut banks: 5%  
    Overhanging vegetation: 3%  
    Other: 0%

---

Table 2. Summary of stream habitat survey for Benewah Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Benewah Creek  
Stream reach: 02  
Survey date: July 14, 1986  
Starting elevation: 2,160 ft.  
Ending elevation: 2,540 ft.  
Reach distance: 18,277 ft.  
Average gradient: 2%  
Maximum gradient: 3%  
Minimum gradient: 2%  
Average width of reach: 21 ft.  
Total surveyed length: 2,851 ft.  
Stream habitat in pools: 9%  
    Class 1 pools: 0%  
    Class 2 pools: 2%  
    Class 3 pools: 5%  
    Class 4 pools: 2%  
Stream habitat in runs: 37%  
Stream habitat in riffles: 11%  
Stream habitat in pocketwater: 43%  
Spawning sites surveyed: 6  
Total stream cover: 36%  
    Large organic material: 0%  
    Boulders: 36%  
    Undercut banks: 0%  
    Overhanging vegetation: 0%  
    Other: 0%

---

Table 3. Summary of stream habitat survey for Benewah Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Benewah Creek  
Stream reach: 03  
Survey date: July 15, 1986  
Starting elevation: 2,540 ft.  
Ending elevation: 2,773 ft.  
Reach distance: 28,431 ft.  
Average gradient: 1%  
Maximum gradient: 1%  
Minimum gradient: 1%  
Average width of reach: 18 ft.  
Total surveyed length: 1,834 ft.  
Stream habitat in pools: 70%  
    Class 1 pools: 24%  
    Class 2 pools: 5%  
    Class 3 pools: 21%  
    Class 4 pools: 20%  
Stream habitat in runs: 24%  
Stream habitat in riffles: 5%  
Stream habitat in pocketwater: 0%  
Spawning sites surveyed: 3  
Total stream cover: 28%  
    Large organic material: 6%  
    Boulders: 2%  
    Undercut banks: 6%  
    Overhanging vegetation: 11%  
    Other: 3%

---

Table 4. Summary of stream habitat survey for Cherry Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Cherry Creek  
Stream reach: 01  
Survey date: July 1, 1986  
Starting elevation: 2,138 ft.  
Ending elevation: 2,140 ft.  
Reach distance: 1,218 ft.  
Average gradient: 1%  
Maximum gradient: 1%  
Minimum gradient: 0%  
Average width of reach: 9 ft.  
Total surveyed length: 503 ft.  
Stream habitat in pools: 73%  
    Class 1 pools: 5%  
    Class 2 pools: 10%  
    Class 3 pools: 58%  
    Class 4 pools: 0%  
Stream habitat in runs: 26%  
Stream habitat in riffles: 0%  
Stream habitat in pocketwater: 0%  
Spawning sites surveyed: 9  
Total stream cover: 28%  
    Large organic material: 7%  
    Boulders: 0%  
    Undercut banks: 2%  
    Overhanging vegetation: 18%  
    Other: 1%

---

Table 5. Summary of stream habitat survey for Cherry Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Cherry Creek  
Stream reach: 02  
Survey date: July 8, 1986  
Starting elevation: 2,140 ft.  
Ending elevation: 2,320 ft.  
Reach distance: 3,046 ft.  
Average gradient: 3%  
Maximum gradient: 4%  
Minimum gradient: 2%  
Average width of reach: 7 ft.  
Total surveyed length: 371 ft.  
Stream habitat in pools: 24%  
    Class 1 pools: 6%  
    Class 2 pools: 0%  
    Class 3 pools: 10%  
    Class 4 pools: 8%  
Stream habitat in runs: 30%  
Stream habitat in riffles: 39%  
Stream habitat in pocketwater: 6%  
Spawning sites surveyed: 0  
Total stream cover: 33%  
    Large organic material: 1%  
    Boulders: 15%  
    Undercut banks: 7%  
    Overhanging vegetation: 10%  
    Other: 0%

---

Table 6. Summary of stream habitat survey for Thomas Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Thomas Creek  
Stream reach: 01  
Survey date: July 30, 1986  
Starting elevation: 2,138 ft.  
Ending elevation: 2,340 ft.  
Reach distance: 4,061 ft.  
Average gradient: 1%  
Maximum gradient: 2%  
Minimum gradient: 1%  
Average width of reach: 7 ft.  
Total surveyed length: 640 ft.  
Stream habitat in pools: 10%  
    Class 1 pools: 0%  
    Class 2 pools: 5%  
    Class 3 pools: 3%  
    Class 4 pools: 2%  
Stream habitat in runs: 38%  
Stream habitat in riffles: 45%  
Stream habitat in pocketwater: 8%  
Spawning sites surveyed: 0  
Total stream cover: 31%  
    Large organic material: 1%  
    Boulders: 6%  
    Undercut banks: 9%  
    Overhanging vegetation: 15%  
    Other: 0%

---

Table 7. Summary of stream habitat survey for Hugus Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Hugus Creek  
Stream reach: 01  
Survey date: September 19, 1986  
Starting elevation: 2,170 ft.  
Ending elevation: 2,250 ft.  
Reach distance: 5,077 ft.  
Average gradient: 2%  
Maximum gradient: 3%  
Minimum gradient: 1%  
Average width of reach: 6 ft.  
Total surveyed length: 358 ft.  
Stream habitat in pools: 25%  
    Class 1 pools: 0%  
    Class 2 pools: 7%  
    Class 3 pools: 4%  
    Class 4 pools: 14%  
Stream habitat in runs: 30%  
Stream habitat in riffles: 45%  
Stream habitat in pocketwater: 0%  
Spawning sites surveyed: 5  
Total stream cover: 24%  
    Large organic material: 3%  
    Boulders: 0%  
    Undercut banks: 7%  
    Overhanging vegetation: 14%  
    Other: 0%

---



Table 8. Summary of stream habitat survey for Street Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Street Creek  
Stream reach: 01  
Survey date: July 30, 1986  
Starting elevation: 2,123 ft.  
Ending elevation: 2,300 ft.  
Reach distance: 10,966 ft.  
Average gradient: 2%  
Maximum gradient: 4%  
Minimum gradient: 2%  
Average width of reach: 11 ft.  
Total surveyed length: 821 ft.  
Stream habitat in pools: 24%  
    Class 1 pools: 3%  
    Class 2 pools: 13%  
    Class 3 pools: 2%  
    Class 4 pools: 6%  
Stream habitat in runs: 33%  
Stream habitat in riffles: 29%  
Stream habitat in pocketwater: 14%  
Spawning sites surveyed: 10  
Total stream cover: 25%  
    Large organic material: 6%  
    Boulders: 13%  
    Undercut banks: 4%  
    Overhanging vegetation: 2%  
    Other: 0%

---

Table 9. Summary of stream habitat survey for Reeds Gulch Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Reeds Gulch Creek  
Stream reach: 01  
Survey date: August 27, 1986  
Starting elevation: 2,135 ft.  
Ending elevation: 2,230 ft.  
Reach distance: 5,077 ft.  
Average gradient: 0%  
Maximum gradient: 1%  
Minimum gradient: 0%  
Average width of reach: 10 ft.  
Total surveyed length: 160 ft.  
Stream habitat in pools: 59%  
    Class 1 pools: 59%  
    Class 2 pools: 0%  
    Class 3 pools: 0%  
    Class 4 pools: 0%  
Stream habitat in runs: 13%  
Stream habitat in riffles: 28%  
Stream habitat in pocketwater: 0%  
Spawning sites surveyed: 20  
Total stream cover: 70%  
    Large organic material: 3%  
    Boulders: 0%  
    Undercut banks: 10%  
    Overhanging vegetation: 6%  
    Other: 51%

---

Table 10. Summary of stream habitat survey for Bond Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Bond Creek  
Stream reach: 01  
Survey date: September 11, 1986  
Starting elevation: 2,130 ft.  
Ending elevation: 2,190 ft.  
Reach distance: 10,052 ft.  
Average gradient: 1%  
Maximum gradient: 1%  
Minimum gradient: 1%  
Average width of reach: 12 ft.  
Total surveyed length: 1,395 ft.  
Stream habitat in pools: 23%  
    Class 1 pools: 5%  
    Class 2 pools: 6%  
    Class 3 pools: 10%  
    Class 4 pools: 2%  
Stream habitat in runs: 27%  
Stream habitat in riffles: 50%  
Stream habitat in pocketwater: 0%  
Spawning sites surveyed: 8  
Total stream cover: 21%  
    Large organic material: 4%  
    Boulders: 2%  
    Undercut banks: 4%  
    Overhanging vegetation: 11%  
    Other: 0%

---

Table 11. Summary of stream habitat survey for Trout Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Trout Creek  
Stream reach: 01  
Survey date: September 17, 1986  
Starting elevation: 2,165 ft.  
Ending elevation: 2,495 ft.  
Reach distance: 13,809 ft.  
Average gradient: 1%  
Maximum gradient: 2%  
Minimum gradient: 1%  
Average width of reach: 23 ft.  
Total surveyed length: 1,546 ft.  
Stream habitat in pools: 24%  
    Class 1 pools: 0%  
    Class 2 pools: 0%  
    Class 3 pools: 5%  
    Class 4 pools: 19%  
Stream habitat in runs: 16%  
Stream habitat in riffles: 49%  
Stream habitat in pocketwater: 12%  
Spawning sites surveyed: 11  
Total stream cover: 9%  
    Large organic material: 1%  
    Boulders: 8%  
    Undercut banks: 0%  
    Overhanging vegetation: 0%  
    Other: 0%

---

Table 12. Summary of stream habitat survey for Mica Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Mica Creek  
Stream reach: 01  
Survey date: August 27, 1986  
Starting elevation: 2,226 ft.  
Ending elevation: 2,555 ft.  
Reach distance: 16,043 ft.  
Average gradient: 1%  
Maximum gradient: 2%  
Minimum gradient: 1%  
Average width of reach: 25 ft.  
Total surveyed length: 532 ft.  
Stream habitat in pools: 22%  
    Class 1 pools: 0%  
    Class 2 pools: 0%  
    Class 3 pools: 20%  
    Class 4 pools: 2%  
Stream habitat in runs: 25%  
Stream habitat in riffles: 30%  
Stream habitat in pocketwater: 23%  
Spawning sites surveyed: 2  
Total stream cover: 16%  
    Large organic material: 0%  
    Boulders: 16%  
    Undercut banks: 0%  
    Overhanging vegetation: 0%  
    Other: 0%

---

Table 13. Summary of stream habitat survey for Mica Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Mica Creek  
Stream reach: 03  
Survey date: September 19, 1986  
Starting elevation: 3,020 ft.  
Ending elevation: 3,060 ft.  
Reach distance: 4,874 ft.  
Average gradient: 2%  
Maximum gradient: 2%  
Minimum gradient: 1%  
Average width of reach: 15 ft.  
Total surveyed length: 1,187 ft.  
Stream habitat in pools: 9%  
    Class 1 pools: 0%  
    Class 2 pools: 0%  
    Class 3 pools: 4%  
    Class 4 pools: 5%  
Stream habitat in runs: 24%  
Stream habitat in riffles: 68%  
Stream habitat in pocketwater: 0%  
Spawning sites surveyed: 0  
Total stream cover: 14%  
    Large organic material: 1%  
    Boulders: 6%  
    Undercut banks: 5%  
    Overhanging vegetation: 2%  
    Other: 0%

---

Table 14. Summary of stream habitat survey for Thorn Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Thorn Creek  
Stream reach: 01  
Survey date: July 24, 1986  
Starting elevation: 2,110 ft.  
Ending elevation: 2,160 ft.  
Reach distance: 5,077 ft.  
Average gradient: 1%  
Maximum gradient: 1%  
Minimum gradient: 1%  
Average width of reach: 15 ft.  
Total surveyed length: 612 ft.  
Stream habitat in pools: 15%  
    Class 1 pools: 0%  
    Class 2 pools: 0%  
    Class 3 pools: 13%  
    Class 4 pools: 2%  
Stream habitat in runs: 46%  
Stream habitat in riffles: 34%  
Stream habitat in pocketwater: 5%  
Spawning sites surveyed: 0  
Total stream cover: 11%  
    Large organic material: 2%  
    Boulders: 5%  
    Undercut banks: 1%  
    Overhanging vegetation: 2%  
    Other: 1%

---

Table 15. Summary of stream habitat survey for Thorn Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Thorn Creek  
Stream reach: 02  
Survey date: July 24, 1986  
Starting elevation: 2,160 ft.  
Ending elevation: 2,285 ft.  
Reach distance: 3,249 ft.  
Average gradient: 3%  
Maximum gradient: 5%  
Minimum gradient: 2%  
Average width of reach: 13 ft.  
Total surveyed length: 528 ft.  
Stream habitat in pools: 5%  
    Class 1 pools: 3%  
    Class 2 pools: 2%  
    Class 3 pools: 0%  
    Class 4 pools: 0%  
Stream habitat in runs: 26%  
Stream habitat in riffles: 6%  
Stream habitat in pocketwater: 63%  
Spawning sites surveyed: 0  
Total stream cover: 48%  
    Large organic material: 3%  
    Boulders: 43%  
    Undercut banks: 0%  
    Overhanging vegetation: 2%  
    Other: 0%

---



Table 16. Stream habitat survey summary for Carlin Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Carlin Creek  
Stream reach: 01  
Survey date: July 24, 1986  
Starting elevation: 2,080 ft.  
Ending elevation: 2,370 ft.  
Reach distance: 2,234 ft.  
Average gradient: 5%  
Maximum gradient: 6%  
Minimum gradient: 4%  
Average width of reach: 7 ft.  
Total surveyed length: 413 ft.  
Stream habitat in pools: 6%  
    Class 1 pools: 0%  
    Class 2 pools: 6%  
    Class 3 pools: 0%  
    Class 4 pools: 0%  
Stream habitat in runs: 1%  
Stream habitat in riffles: 5%  
Stream habitat in pocketwater: 87%  
Spawning sites surveyed: 0  
Total stream cover: 86%  
    Large organic material: 9%  
    Boulders: 19%  
    Undercut banks: 2%  
    Overhanging vegetation: 56%  
    Other: 0%

---

Table 17. Summary of stream habitat survey for Carlin Creek, St. Maries District, St. Joe National Forest, 1986..

---

Stream: Carlin Creek  
Stream reach: 02  
Survey date: July 24, 1986  
Starting elevation: 2,370 ft.  
Ending elevation: 3,360 ft.  
Reach distance: 12,997 ft.  
Average gradient: 7%  
Maximum gradient: 8%  
Minimum gradient: 6%  
Average width of reach: 6 ft.  
Total surveyed length: 159 ft.  
Stream habitat in pools: 40%  
    Class 1 pools: 31%  
    Class 2 pools: 9%  
    Class 3 pools: 0%  
    Class 4 pools: 0%  
Stream habitat in runs: 6%  
Stream habitat in riffles: 19%  
Stream habitat in pocketwater: 34%  
Spawning sites surveyed: 0  
Total stream cover: 56%  
    Large organic material: 12%  
    Boulders: 18%  
    Undercut banks: 10%  
    Overhanging vegetation: 16%  
    Other: 0%

---

Table 18. Summary of stream habitat survey for Alder Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Alder Creek  
Stream reach: 01  
Survey date: August 28, 1986  
Starting elevation: 2,240 ft.  
Ending elevation: 2,665 ft.  
Reach distance: 24,369 ft.  
Average gradient: 3%  
Maximum gradient: 4%  
Minimum gradient: 2%  
Average width of reach: 14 ft.  
Total surveyed length: 392 ft.  
Stream habitat in pools: 0%  
    Class 1 pools: 0%  
    Class 2 pools: 0%  
    Class 3 pools: 0%  
    Class 4 pools: 0%  
Stream habitat in runs: 64%  
Stream habitat in riffles: 36%  
Stream habitat in pocketwater: 0%  
Spawning sites surveyed: 0  
Total stream cover: 4%  
    Large organic material: 39%  
    Boulders: 0%  
    Undercut banks: 39%  
    Overhanging vegetation: 0%  
    Other: 0%

---

Table 19. Summary of stream habitat survey for Alder Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Alder Creek  
Stream reach: 02  
Survey date: August 28, 1986  
Starting elevation: 2,665 ft.  
Ending elevation: 2,875 ft.  
Reach distance: 14,215 ft.  
Average gradient: 1%  
Maximum gradient: 1%  
Minimum gradient: 1%  
Average width of reach: 13 ft.  
Total surveyed length: 715 ft.  
Stream habitat in pools: 29%  
    Class 1 pools: 23%  
    Class 2 pools: 0%  
    Class 3 pools: 0%  
    Class 4 pools: 6%  
Stream habitat in runs: 43%  
Stream habitat in riffles: 28%  
Stream habitat in pocketwater: 0%  
Spawning sites surveyed: 3  
Total stream cover: 36%  
    Large organic material: 14%  
    Boulders: 5%  
    Undercut banks: 9%  
    Overhanging vegetation: 8%  
    Other: 0%

---

Table 20. Summary of stream habitat survey for Santa Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Santa Creek  
Stream reach: 01  
Survey date: August 12, 1986  
Starting elevation: 2,585 ft.  
Ending elevation: 2,805 ft.  
Reach distance: 44,880 ft.  
Average gradient: 1%  
Maximum gradient: 1%  
Minimum gradient: 1%  
Average width of reach: 17 ft.  
Total surveyed length: 1,340 ft.  
Stream habitat in pools: 76%  
    Class 1 pools: 19%  
    Class 2 pools: 20%  
    Class 3 pools: 29%  
    Class 4 pools: 8%  
Stream habitat in runs: 0%  
Stream habitat in riffles: 12%  
Stream habitat in pocketwater: 12%  
Spawning sites surveyed: 5  
Total stream cover: 20%  
    Large organic material: 1%  
    Boulders: 13%  
    Undercut banks: 1%  
    Overhanging vegetation: 5%  
    Other: 0%

---

Table 21. Summary of stream habitat survey for Charlie Creek, St. Maries District, St. Joe National Forest, 1986.

---

Stream: Charlie Creek  
Stream reach: 01  
Survey date: August 12, 1986  
Starting elevation: 2,805 ft.  
Ending elevation: 2,900 ft.  
Reach distance: 17,262 ft.  
Average gradient:  
Maximum gradient:  
Minimum gradient:  
Average width of reach: 19 ft.  
Total surveyed length: 694 ft.  
Stream habitat in pools: 59%  
    Class 1 pools: 10%  
    Class 2 pools: 14%  
    Class 3 pools: 8%  
    Class 4 pools: 27%  
Stream habitat in runs: 7%  
Stream habitat in riffles: 9%  
Stream habitat in pocketwater: 0%  
Spawning sites surveyed: 9  
Total stream cover: 24%  
    Large organic material: 4%  
    Boulders: 2%  
    Undercut banks: 3%  
    Overhanging vegetation: 15%  
    Other: 0%

---

The second objective was to identify factors which might limit salmonid production. The lack of cover, which provides high quality pools, may be the most important factor limiting trout production in the Coeur d'Alene, St. Joe, and St. Maries river systems. Job 1 of this project provided fish density and species composition information through electrofishing and/or underwater observation in all streams that were surveyed for habitat. During underwater observation, over the last three years in tributaries to the Coeur d'Alene, St. Joe, and St. Maries rivers we have observed the relationship between good cover components (particularly large organic material) and high fish densities. When pools or runs included large organic material as cover, they invariably had more fish than those where cover was absent or provided by boulders, depth, or overhanging vegetation. Lider (in press) also noted in his discussion that higher fish densities were in pools with large organic material. A number of other studies have shown the importance of organic material as cover for fish (Chapman and Bjornn 1969; Dolloff 1983; Bryant 1983), as essential winter habitat (Bustard and Narver 1975; Heifetz et al. 1986) and for fish food production (Elliot 1986).

The St. Joe and St. Maries river tributaries have low densities of trout in all streams observed. Brook trout have taken over the severely degraded habitat in lower Reeds Gulch. The need for proper habitat management is critical to reversing the decline in trout numbers and essential to restoring tributaries to higher production levels. A serious look at restoration of habitat in many streams is essential to providing a viable trout fishery to St. Maries area anglers.

The summaries provided in Tables 1 through 21 and Figures 2 through 7 leave out many details on habitat parameters that can be of value to the land or fish manager in a given drainage. Appendix B is an example of detailed habitat information generated, and is provided for readers desirous of doing habitat surveys and needing background knowledge on information provided from this methodology. A complete analysis and recommendations using this information will be done after the 1987 field season in the completion report.

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## APPENDICES

Appendix A. Standard form used for stream habitat surveys.

FISHERIES HABITAT EVALUATION

JULY 2, 1985

District # \_\_\_\_\_ Reach # \_\_\_\_\_ Stream Name \_\_\_\_\_ Date \_\_\_\_\_

Forest # \_\_\_\_\_ Elevation Start \_\_\_\_\_ Elevation End \_\_\_\_\_ Total Reach Distance \_\_\_\_\_

Valley Bottom \_\_\_\_\_ Channel Type \_\_\_\_\_ Stream Order \_\_\_\_\_ Stream Temp \_\_\_\_\_ Air Temp \_\_\_\_\_

H A B T Y P E	L E C T H F T	W I T H F T	G R A D E %	P O L Y T E R M I N I S T R I C T	COVER COMPONENTS (PERCENTAGE)					SPAWNING AREA			F I N E S T E R I O R I T Y	REMARKS
					L	S	U	O	V	S	C	Z		
														PROJECTS
														ELEVATIONS
														PASSAGE PROBLEMS
														ETC.

# Appendix B. A computer summary of habitat survey data.

## FISHERIES HABITAT SUMMARY

STREAM NAME: EVANS

FOREST: 04  
DISTRICT: 53

REACH NUMBER: 01  
STREAM NUMBER: C30

STARTING ELEVATION OF REACH: 02135 FT  
ENDING ELEVATION OF REACH: 02340 FT

TOTAL REACH DISTANCE: 21120 FT

VALLEY BOTTOM TYPE: 3  
STREAM CHANNEL TYPE: 02  
STREAM ORDER: 5

AIR TEMPERATURE (IN DEGREES CELSIUS): 16  
STREAM TEMPERATURE (IN DEGREES CELSIUS): 17

SURVEY DATE(MONTH/DAY/YEAR): 082155

### INPUT DATA

SITE	HABT	HAEL	HABW	PCOLCR	CLOM	CELD	CUD	CUV	CTM	SPWUP	SPWSCR	GRAD
001	001	035	15	03	10	00	05	30	10	00	00	01
002	005	040	15	00	05	00	02	20	00	00	00	01
003	005	010	13	00	20	00	05	30	00	00	00	01
004	005	015	20	00	20	00	10	05	00	00	00	01
005	001	045	15	01	15	00	05	30	00	00	00	01
006	001	025	13	01	30	00	05	30	00	00	00	00
007	002	012	12	01	40	00	00	20	00	00	04	00
008	004	062	15	00	00	00	00	00	00	01	04	00
009	005	035	10	00	20	00	05	00	00	01	04	00
010	008	030	03	00	00	00	00	00	00	00	00	00
011	002	027	15	02	05	00	15	20	00	00	00	00
012	002	048	17	00	00	00	00	00	00	01	04	00
013	003	080	12	01	20	00	05	05	01	00	00	00
014	005	060	06	00	20	00	05	05	00	00	00	00
015	005	030	14	00	02	00	01	32	00	00	00	00
016	008	020	20	00	00	00	00	00	00	00	00	00
017	008	050	22	00	07	00	00	00	00	00	00	00
018	005	077	12	00	01	01	00	00	00	00	00	00
019	005	021	05	00	05	00	01	02	00	01	01	00
020	005	048	03	00	01	00	05	05	00	01	01	00
021	004	054	10	00	00	00	00	00	00	00	00	02
022	005	053	16	00	00	00	00	00	00	00	00	00
023	005	023	05	00	05	10	10	10	00	00	00	00
024	008	032	10	00	00	00	00	00	00	01	04	00
025	005	040	10	00	00	00	00	00	00	00	00	00
026	002	026	08	01	25	05	05	15	00	00	00	00
027	005	045	08	00	20	00	05	30	00	01	03	00

028	005	015	05	00	00	00	20	30	00	00	00	00
029	005	020	15	00	00	00	00	00	00	00	00	00
030	005	025	12	00	05	00	00	20	00	00	00	00
031	003	015	15	05	00	20	10	05	00	00	00	00
032	005	045	10	00	00	00	00	10	00	00	00	02
033	004	016	10	00	00	00	01	00	00	01	04	01
034	003	019	14	01	10	15	00	20	00	00	00	00
035	008	035	12	00	00	00	00	00	00	00	00	00
036	009	025	17	00	00	00	00	00	00	00	00	00
037	008	026	15	00	00	00	00	00	00	00	00	00
038	005	050	11	00	00	20	00	00	00	01	01	00
039	004	010	13	00	00	00	00	00	00	00	00	00
040	005	016	08	00	00	10	00	00	00	00	00	00
041	008	040	07	00	00	00	00	00	00	01	02	00
042	005	065	15	00	00	00	00	00	00	00	00	00
043	005	065	10	00	00	00	00	00	00	00	00	00
044	007	045	13	00	00	00	00	00	00	00	00	00
045	005	005	15	00	00	00	00	00	00	00	00	00
046	005	140	10	00	00	00	00	00	00	00	00	00
047	004	025	10	01	00	00	00	00	00	00	00	00
048	003	030	13	01	05	00	00	00	00	01	04	00
049	007	025	11	00	00	00	00	00	00	00	00	00
050	005	200	12	00	00	00	00	00	00	00	00	00
051	005	060	10	00	00	00	00	00	00	00	00	00
052	005	015	05	00	00	00	00	00	00	00	00	00
053	005	076	11	00	00	00	00	00	00	00	00	00
054	004	037	10	02	00	00	00	00	00	00	00	00
055	005	018	12	00	00	00	00	00	00	00	00	00
056	005	010	10	00	00	00	00	00	00	00	00	00
057	005	107	11	00	00	00	00	00	00	00	00	00
058	003	025	15	01	25	00	00	00	00	04	04	00
059	007	033	12	00	00	00	00	00	00	00	00	00
060	003	020	10	01	00	00	00	00	00	00	00	00
061	007	047	07	00	00	00	00	00	00	00	00	00

# Appendix B. Continued.

## KEY

SITE: SAMPLE SITE NUMBER

HABT: HABITAT TYPE

001=CLASS 1 POOL 005=RUN  
002=CLASS 2 POOL 006=POCKETWATER  
003=CLASS 3 POOL 007=GLIDE  
004=CLASS 4 POOL 008=RIFPLE

HABL: HABITAT LENGTH IN FEET

HABW: HABITAT WIDTH IN FEET (00 IF UNRECORDED)

POOLCR: FEATURE THAT CREATED POOL HABITAT TYPE

01=LARGE ORGANIC MATERIAL 04=BEAVER DAM  
02=BOULDER(S) OR BEDROCK 05=OTHER  
03=MEANDER

CLOM: PERCENTAGE OF SITE WHERE LARGE ORGANIC MATERIAL PROVIDES FISH COVER

CBLD: PERCENTAGE OF SITE WHERE BOULDERS OR BEDROCK PROVIDE FISH COVER

CUB: PERCENTAGE OF SITE WHERE UNDERCUT BANKS PROVIDE FISH COVER

COV: PERCENTAGE OF SITE WHERE OVERHANGING VEGETATION PROVIDES FISH COVER

COTH: PERCENTAGE OF SITE WHERE OTHER MATERIAL PROVIDES FISH COVER

SPHNUM: TOTAL SPAWNING SITES, IF FOUND

SPWSCR: FEATURE THAT CAUSED SPAWNING SITE(S)

01=LARGE ORGANIC MATERIAL 04=GRADIENT  
02=BOULDER(S) OR BEDROCK 05=ERODING  
03=MEANDER 06=OTHER

GRAD: PERCENT GRADIENT (00 IF UNRECORDED)

## ERRONEOUS INPUT SUMMARY

THIS PROGRAM DETECTED NO ERRORS IN THE DATA RECORDS OF THIS DATA SET.  
THEREFORE THE SUMMARY STATISTICS OF THIS REACH WILL BE WRITTEN ON TWO  
FILES: OUTPUT AND PROXY (THIS FILE IS FOR FURTHER DATA PROCESSING).

AVERAGE GRADIENT OF REACH: 01X  
MAXIMUM GRADIENT OF REACH: 01X  
MINIMUM GRADIENT OF REACH: 01X

AVERAGE WIDTH OF REACH: 115 FT  
TOTAL SURVEYED LENGTH: 2581 FT

## HABITAT CONDITIONS

HABITAT	LENGTH (FT)	% TOTAL	AVE. WIDTH (FT)	TOT. AREA (SQ FT)	SPAWNING SITES/SURVEY	SPAWNING SITES/REACH
RIFPLE	0631	24	015	10215	013	095
GLIDE	0150	05	011	01650	000	000
POCKETWATER	0000	00	000	00000	000	000
RUN	1531	53	011	16841	005	037
CL. 1 POOL	0206	07	014	02884	000	000
CL. 2 POOL	0065	02	015	00975	000	000
CL. 3 POOL	0166	06	013	02158	002	015
CL. 4 POOL	0062	02	010	00620	000	000
TOT. POOLS	00519	017				

Appendix B. Continued.

POOL CREATORS																		
		WOODY MAT.			BOULDERS			MEANDERS			BEAVER DAMS			OTHER			TOTAL	
		N/S	N/R	N/M	N/S	N/R	N/M	N/S	N/R	N/M	N/S	N/R	N/M	N/S	N/R	N/M	N/R	N/M
CL. 1		002	015	004	000	000	000	001	007	003	000	000	000	000	000	000	022	006
CL. 2		002	015	004	001	007	002	000	000	000	000	000	000	000	000	000	022	006
CL. 3		003	037	009	000	000	000	000	000	000	000	000	000	001	007	002	044	011
CL. 4		001	007	002	001	007	002	000	000	000	000	000	000	000	000	000	014	004
TOTAL		074	019		014	004		007	002		000	000		007	002		102	027
NOTE: N/S=NUMBER/SURVEY, N/R=NUMBER/REACH, N/M=NUMBER/MILE																		

SPAWNING SITE CREATORS						
	WOODY MAT.	BOULDERS	MEANDERS	GRADIENT	ERODING	OTHER
NUM. SUR.	004	003	001	012	000	000
NUM/REACH	029	022	007	085	000	000
NUM/MILE	007	005	002	022	000	000

NOTE: NUM. SUR.=NUMBER SURVEYED, NUM=NUMBER

STREAM COVER PERCENTAGES					
	ORGANIC MATERIAL	BOULDERS	UNDERCUT BANKS	OVERHANGING VEGETATION	OTHER
CL. 1 POOLS	015	000	005	031	004
CL. 2 POOLS	019	002	007	020	000
CL. 3 POOLS	014	007	004	035	000
CL. 4 POOLS	001	001	003	000	000
RUNS	003	002	001	004	000
POCKETWATER	000	000	000	000	000
GLIDE	000	000	000	003	000
MTD. TOTAL	005	002	002	037	000

JOB PERFORMANCE REPORT

State of: Idaho

Name: RIVER AND STREAM  
INVESTIGATIONS

Project No.: F-73-R-9

Title: North Idaho Stream  
Fishery Research

Subproject No.: IV

Study No.: IV

Job No.: 3. Fish Species and Stock Evaluation

Period Covered: March 1, 1986 to February 28, 1987

**ABSTRACT**

Recommendations for species or stocks of fish to enhance the fishery of the lower St. Joe and St. Maries rivers systems will be made when the evaluation of game fish populations and stream habitat is completed. Basic guidelines from the Idaho Department of Fish and Game Fisheries Management Plan, 1986-1990, will be followed.

Author:

William D. Horton  
Senior Fishery Research Biologist

## **INTRODUCTION**

Fish communities in Lake Coeur d'Alene and the lower sections of its major tributaries have been altered by overexploitation of desirable trout species, degradation or loss of habitat, competition by introduced species, and the building of Post Falls Dam in 1906. Local anglers have placed demands on the Department to provide additional fishing opportunities in the vicinity of St. Maries. Concerns about increases in nongame fish species, and interest in exotic introductions to provide additional fisheries, have created the need to evaluate potential introductions for this area.

The Fisheries Management Plan of the Idaho Department of Fish and Game, 1986-1990 (1986), provides guidelines for the introduction of fish species. "Native wild stocks of resident trout will receive priority consideration in all management decisions involving resident fish", is the basic guideline. With specific concern to the introduction of exotic species, the Plan states: "Non-native salmonids and warmwater game fish will not be introduced into waters where they adversely affect goals and objectives set for native...programs. However, suitable exotic species will be utilized to establish sport fisheries in habitat unsuited for native species, or where the introduced species can provide increased fishing opportunity without undue damage to existing species."

## **OBJECTIVES**

To evaluate and recommend species or stocks of fish that will enhance the fishery of the lower St. Joe and St. Maries river systems.

## **METHODS**

The status of the game fish populations and habitat in the lower St. Joe and St. Maries river systems is being evaluated. Information from this evaluation, combined with a literature review of game fish species and direction from the Fisheries Management Plan, 1986-1990 (1986), will provide the basis for management recommendations.

Because of the proximity of the Coeur d'Alene and St. Joe rivers and the likelihood of fish movement between these rivers, no recommendation will be made until both systems are studied. Information will be provided after the 1987 field season.

## **LITERATURE CITED**

Idaho Department of Fish and Game. 1986. Idaho Fisheries Management Plan, 1986-1990. Idaho Department of Fish and Game, Boise.



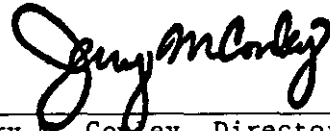
Submitted by:

William D. Horton  
Senior Fishery Research Biologist

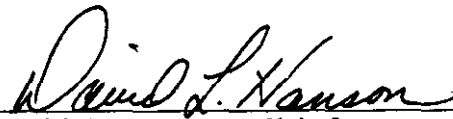
Michael F. Mahan  
Fishery Technician

Approved by:

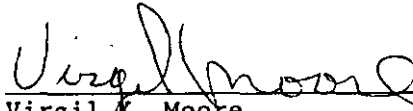
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